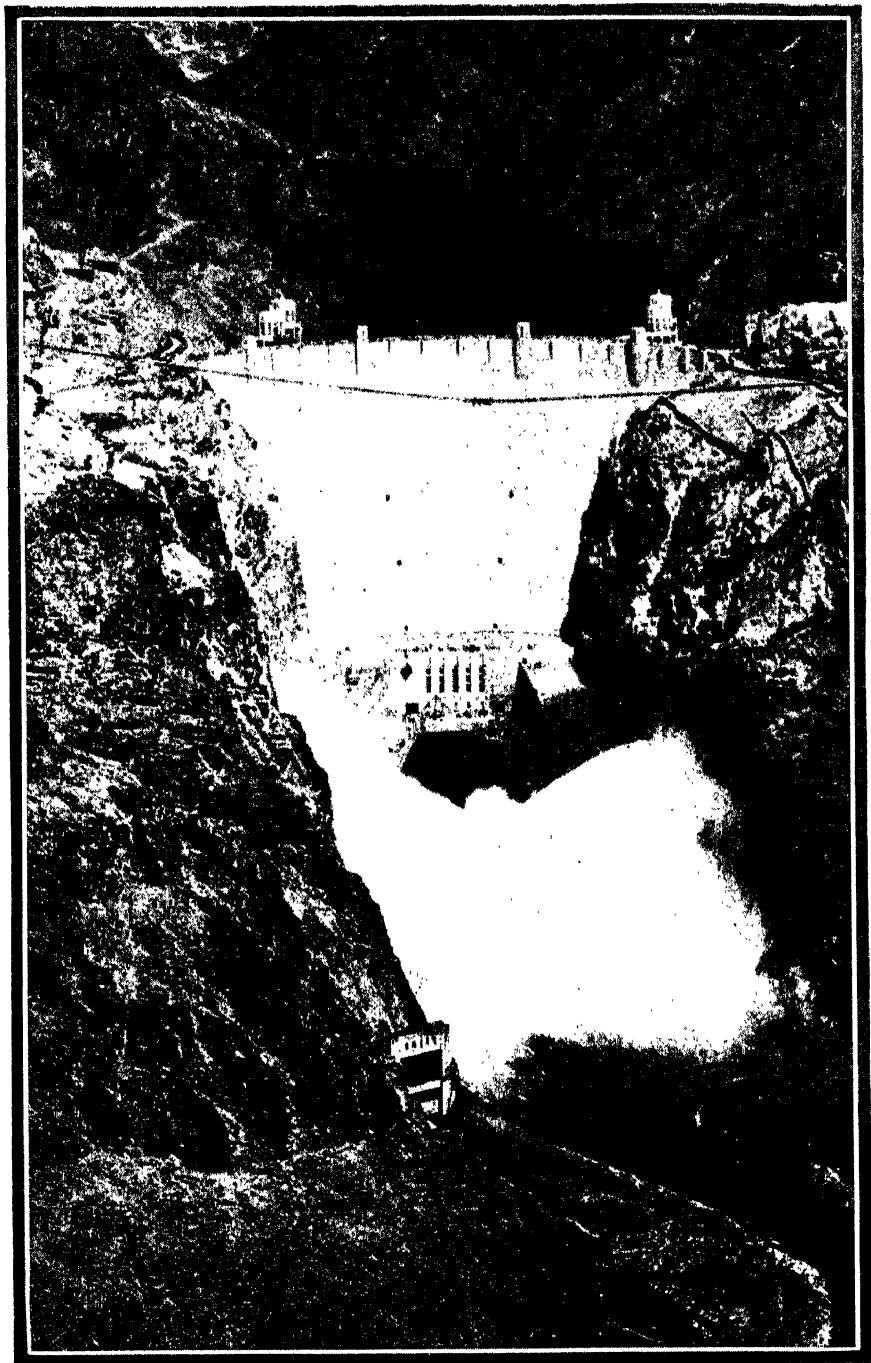




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—An Illustrated Treasury of Knowledge—

Prepared under the Editorship of

C. RALPH TAYLOR

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VOLUME VIII

Kosovo

Kosovo, former vilayet of European Turkey, divided at the close of the Balkan Wars between Serbia (9,973 sq. m.) and Montenegro (1,961 sq. m.). There are chrome mines, and fruit, grain, live stock, and tobacco are exported. Rice and silk are cultivated.

Kossuth, Francis (1841-1914), Hungarian statesman, was born in Budapest, the son of Lajos or Louis Kossuth. He was educated as a technical engineer in England, France, and Italy, and from 1861 to 1894 practiced his profession with marked success in Italy. Upon his father's death in 1894, he returned to Hungary, took the oath of allegiance, was elected to parliament, and became the leader of the Independence party until 1909.

Kossuth, Lajos (Louis) (1802-94), Hungarian patriot, descendant of an ancient and noble family of the Magyar race, was born in Monok, county of Zemplin, Hungary. In 1882 he commenced his political career at the diet of Pressburg and as editor of a liberal journal. After numerous attempts to suppress his paper, Kossuth was arrested in 1837 and was in prison until 1840. Following his release in that year, he became editor of *Pesti Hírlap*, an ultra-liberal journal which had immense popularity and influence. Upon the revolt, in 1847, of the Croats and Serbians, secretly aided by Austrian agents, Kossuth was made head of a committee of National Defence, with the powers of a dictator. Russia intervened (1849), the Hungarian forces were defeated at Temesvar, and Kossuth fled to Turkey, where he was kept a prisoner in spite of Austrian and Russian demands for his surrender. He was liberated in September, 1851, upon the intervention of England and the United States, visited England and later America, where he remained until July, 1852, being received with the greatest enthusiasm throughout the country. He refused to recognize the compromise between Austria and Hungary effected in 1867, refusing a seat in the Diet to which he was elected. Consult his *Memories of my Exile* (1880).

Kostroma, government of Central Russia. The surface, which is watered by the Volga, is generally flat and is largely forest clad (60 per cent.), with numerous swamps in the north and sandy stretches in the south. The climate is severe. Hemp is grown extensively, horses are bred, and fisheries are of importance; p. 1,830,450.

Kostroma, city, Central Russia, capital of the government of Kostroma, is situated on the Volga near its junction with the River Kostroma; capital of a district of the U. S. S. R.; 230 m. n. e. of Moscow. Outside the city is the Ipatiev Monastery, founded in 1330 by the Tatar Prince, Zacharias Tchet. The Cathedral of the Trinity within the Monastery contains many objects of interest. Kostroma has large spinning mills, tanneries, cement works, and manufactures of candles, wax, brick, and tobacco; p. 67,000.

Kostroma, river, Central Russia, tributary of the Volga. Its length is nearly 200 m., of which half is navigable throughout the year. The area of its basin is nearly 8,000 sq. m.

Kosztá Affair, a diplomatic episode between the United States and Austria, having to do with the rights of immigrants to the United States, who have declared an intention of becoming citizens, but have not yet been fully naturalized or, more properly, with domiciled aliens. Martin Koszta, a Hungarian, after taking part in the Hungarian revolution of 1848, had come to the United States, and in 1852 had declared his intention of becoming a citizen. In 1852 he went on private business, to Smyrna, Turkey, where, notwithstanding his having procured a passport (or *tezkerah*) from the American consul, he was seized and maltreated at the instigation of the Austrian consul, and was imprisoned on an Austrian war vessel, the *Huszar*. Secretary of State W. L. Marcy in the famous 'Hülsemann letter,' which was made public, asserted that 'Koszta was seized without any rightful authority,' that he had 'acquired the right to claim protection from the United States,' and that the United States 'had the right to extend it to him.' Koszta was thereupon allowed to return to the United States. The affair established a precedent which has since been followed, in cases resembling it, by the U. S. Government.

Kotah, town, capital of a feudatory state of same name, Rajputana, India, is situated on the right bank of the Chambal. The state has an area of 5,684 sq. m. and a population of 639,089.

Kotayam, town, feudatory state of Travancore, Madras Presidency, India; the headquarters of the Syrian Christian Church in India; p. 18,000.

Koto, a Japanese stringed instrument some-

what resembling a harp. It is played with both hands, by means of ivory appendages affixed to the fingers.

Kottbus, or **Cottbus**, town, Prussian province of Brandenburg, is situated on the River Spree; 71 m. s.e. of Berlin. Its industries include manufactures of cloth, woolens, linens, carpets, hats, and jute, brewing, ironfounding, tanning, and distilling; p. 50,000.

Koumiss, an alcoholic beverage made originally in Siberia and Russia by fermentation of mare's milk. It is frothy, resembles buttermilk in taste and odor, and contains caseine in the form of a fine suspended curd. In the United States and Europe an imitation koumiss is made by fermenting cow's milk with yeast at a low temperature, often with the addition of cane sugar. Koumiss contains from one to two per cent. of alcohol, is an excellent food, and because of its peptone and lactic acid content is a valuable aid to digestion.

Koussevitzky, Sergei (Alexandrovitch), (1874-), conductor, was born in Russia. After directing for eight years the orchestra he had founded in Moscow, he travelled widely; and in 1924 he was invited to be the conductor of the Boston Symphony Orchestra. He has composed concertos and other orchestral compositions, and also compositions for the double bass, on which he is an accomplished soloist.

Kovno, province, Lithuania, lying between Poland and Prussia; area, 15,600 sq. m. The surface is mostly flat. All the rivers belong to the Baltic basin, the most important being the Niemen. Agriculture is the leading industry and comprises flax, potato, and fruit culture, market-gardening, cattle-rearing, bee-keeping and fishing. At the third partition of Poland in 1795 it fell to Russia and at the close of the Great War became a part of Lithuania; p. 1,857,100, of whom 75 per cent. are Lithuanians.

Kovno, or **Kaunas**, city, provisional capital of Lithuania prior to Aug. 3, 1940, when Lithuania was reannexed by the Soviet Union. It is an important commercial center and is the seat of the University of Kovno; p. 152,365.

Kowloon, peninsula, China, opposite Hongkong. A small part of it was ceded to Great Britain in 1861, and in 1898 a lease for ninety-nine years of about 356 sq. m., including the port of Kowloon, Mirs Bay and Deep Bay, and the island of Lan-tao, was obtained by the British government. The harbor of Kowloon has been a free port since 1887; p. 200,000.

Kowtow. See **Kotow**.

Kozlov, town, Soviet Russia, in Tambov

government. About a mile and a half from the town is the famous convent of the Trinity, where an important annual fair is held; p. 53,318.

Kra, an isthmus connecting the Malay Peninsula and the continent of Asia. At its narrowest it is only 10 m. wide, and not more than 100 ft. above sea-level.

Krafft-Ebing, Richard, Baron von (1840-1902), German neurologist, was born at Mannheim. Becoming professor of psychiatry at the University of Strassburg in 1872, he later occupied similar professorships at Graz and Vienna. He is the author of numerous books dealing with pathological psychology. Many of his works have been widely translated, including his *Psychopathia Sexualis*, one of the standard works in its field. Other publications available in English translations include *An Experimental Study in the Domain of Hypnotism* (1889), *Psychosis Menstrualis* (1902) and *Text Book of Insanity* (1905).

Krag, Thomas Peter (1868-1913), Norwegian novelist. He was educated at the University of Christiania (Oslo) and early adopted literature as a profession. He excels in describing the influence of the grim, uncanny Norwegian coast scenery on those who live near it, and his work is full of force and dignity. His published works include *Eensomme Mennesker* (1893); *Ulf Ran* (1897); *Kobberslangen* (1895); *Hjem* (1900); *Gumvor Kjeld* (1904); and the drama, *Kong Aagon* (1894).

Krakatoa, small volcanic island in Sunda Strait, between Sumatra and Java, East Indies. In May-August, 1883, it was the scene of a series of volcanic discharges among the most tremendous eruptions known to history. As a result of the explosion, the north part of the island, including its highest peak, disappeared altogether.

Krakau, or **Krakow**, Poland. See **Cracow**.

Krasnoe Selo, now known as **Krasni**, summer resort, Soviet Russia, in Leningrad government, 16 m. s.w. of Leningrad. It is picturesquely situated on the Dudergovski Lakes. It was formerly one of the chief military camps of Russia; p. 4,000.

Krasnovodsk, fortress, Asiatic Russia, on the eastern shore of the Caspian Sea. It is the starting-point of the Transcaspian Railway.

Kraszewski, Jozef Ignacy (1812-87), Polish author, was born in Warsaw. In 1841-52 he edited the *Athenæum* at Vilna, and in 1860 became editor of the *Gazeta Codzienna* but in 1863 settled in Dresden. In 1884 he was

sentenced to seven years' imprisonment for high treason, but was liberated in 1886. He was a voluminous writer but it is upon his novels that his reputation chiefly rests. These include *Poeta i Swiaten* (1839); *Ueana* (1843); *Moriturus* (1874-5); *Resurrecturi* (1876). His novels appeared in 102 vols. (1871-5).

Krefeld, town, Germany, in Rhineland province, a centre for silk and velvet manufacture. There are also railway repair shops, engineering works, iron foundries, manufactures of sugar and chemicals, and breweries. The foundations of its present prosperity were laid in the 16th and 17th centuries by refugee Mennonites and Protestants; p. 165,300. Its steel and chemical works were virtually destroyed by the Allies in World War II.

Krehbiel, Henry Edward (1854-1923), American music critic, was born in Ann Arbor, Mich. He studied law in Cincinnati, but abandoned it to take a position on the *Gazette* of that city, of which he was music critic from 1874 to 1880. In the latter year he accepted a similar position on the *New York Tribune*, and occupied a prominent place as a musical critic. He was identified with the rise of Wagnerian music drama in America, was a juror at the Paris exposition of 1900, and was decorated by the French government. He is the author of *The Philharmonic Society of New York* (1892), *How to Listen to Music* (1896), *Chapters of Opera* (1909), *Afro-American Folk-songs* (1914) *More Chapters of Opera* (1919), and editor of various textbooks.

Kreisler, Fritz (1875-), Austrian violinist, was born in Vienna. He was educated at the Vienna and Paris Conservatories and toured America in 1888-9. He made his début in Berlin in 1899, first appeared in London in 1901 and since that time has played in all the leading cities of Europe and the United States. He served in the Austrian army during the Great War. He is considered one of the great violinists of the world. He published *Four Weeks in the Trenches—the War Story of a Violinist* (1915).

Kremenchug, town, Soviet Russia, in Poltava government, Ukraine. It is one of the principal commercial centres of Little Russia, and one of the chief river ports on the Dnieper. Its liqueurs and preserved fruits are famous; and the smelting of iron ore is important; p. 57,331.

Kremlin. See *Moscow*.

Kreutzer, Rodolphe (1766-1831), French musician and violinist, was born in Versailles. An exponent of the Italian school, he was (1790) first violin at the Italian theatre in

Paris, and from 1817 until his death was chef d'orchestre at the Paris opera. Beethoven's *Kreutzer Sonata* was dedicated to him.

Kreuzer, former Austrian copper coin (100 kr.=1 gulden), so called from the cross formerly stamped upon it, with a value of one-fifth of an English penny.

Kriegspiel, or **The War Game**, invented by a Prussian officer in 1824, is intended to afford a representation of military manoeuvres. It is played on contoured maps of a sufficiently large scale to show the main features of the ground, and enable the effect of fire and cover from view to be estimated. The opposing troops are indicated by metal blocks or dice, colored red and blue, which are made to scale to represent the front of battalions, squadrons, batteries, companies, patrols, and vedettes. The game may be played with a minimum number of three persons, one to act as umpire and the other two to command the opposing forces. One small map suffices for the strategic game, showing only the larger operations and omitting tactical details, while for the elementary and detailed game three maps are required either in adjoining rooms or separated from one another by screens. The game is generally brought to a conclusion when one side has obtained a decisive advantage over the other, or when the bulk of the forces on both sides are in such close contact as to render a decision of the result too difficult.

Kriemhild, the heroine of the *Nibelungenlied*, a sister of Gunther, king of Worms, and wife of Siegfried, possessor of the Nibelungen hoard.

Kriloff, Ivan Andreevitch (1768-1844), Russian fabulist, was born in Moscow. He was for some time secretary to the governor of Livonia, and held an appointment in the imperial library at St. Petersburg (1812-41). His *Fables* which appeared in 1809 have always been very popular in Russia.

Krishna, Hindu god, the eighth incarnation of Vishnu. The circumstances of his birth and early life are set forth in two modern supplements to the *Mahābhārata*, called the *Harivansa-pairan* and the *Bhagavatapurānas*. The Krishna of the *Bhagavad-Gita* represents a great spiritual teacher; but the popular legend of his dalliance with the Gopis (wives and daughters of cowherds), and the indecencies of his worship as *Vallabhacharya* present a less admirable picture of Hinduism.

Kristiansand or **Christiansand**, town Norway, in Vest Ogder province, at the mouth of the Saetersdal River. The cathedral, re-

built in the Gothic style since 1880, contains an altar-piece, *Christ at Emmaus*, by Elif Petersen. It is the largest town on the south coast. Founded by Christian IV. of Denmark in 1641 after repeated fires it was rebuilt in 1892; p. 16,605.

Kristianstad, or **Christianstad**, town, Sweden, capital of Kristianstad co., prettily situated about 14 m. from the Baltic, on the peninsula Allon in River Helgra. The chief building is the Trinity Church, of the time of Christian IV., built in the Renaissance style. The town has some industries and a lively trade in spirits and agricultural produce. A garrison is stationed in the place, which is the seat of the chief tribunal for Scania and Bleking. It was founded by Christian IV. in 1614, was ceded to Sweden (1658), and suffered many sieges in the Swedish-Danish wars; p. 13,215.

Kronstadt, fortified seaport, Russia, in Leningrad government, is situated on the eastern end of Kotlin island, at the head of the Gulf of Finland, less than 18 m. W. of Leningrad, which it protects from attacks by sea. To the S. of the town and harbors is the fort of Kronslot. Since the construction of the maritime canal uniting Kronstadt with Leningrad, the largest vessels are able to go up to the quays of the capital. Kronstadt was founded by Peter I. in 1710, and has ever since been the principal naval arsenal of Russia in the Baltic. The Baltic Fleet of Soviet Russia anchors here and the city is of great strategic importance; p. 24,000.

Kronstadt, town, Roumania, picturesquely situated at the foot of the Transylvanian Alps. It is strongly fortified. Its Gothic Protestant cathedral dates from 1385. It is an important industrial city having manufactures of cloth, leather, cement, and candles, also petroleum refineries. In the 16th century it became the centre of Protestantism. During the World War it was occupied by Gen. von Falkenhayn, Sept.-Oct. 1916, and the Austro-German forces when the Roumanian army withdrew from Transylvania to meet Bulgarian troops elsewhere; p. 50,000.

Kroomen, **Kru**, or **Croo**, properly **Crao**, a negro tribe inhabiting the coasts of Liberia and French Guinea, West Africa. They are among the most active of negro races, are skillful sailors and boat-builders, and the best laborers in all West Africa.

Kroonstadt, town, British South Africa, in Orange Free State. It is an important railway centre, an educational centre for the Orange Free State, and grows large quantities of maize; p. 10,000.

Kropotkin, Peter Alexeievitch, Prince (1842-1921), Russian geographer and nihilist was born in Moscow. He became secretary to the Physical Geography Section of the Geographical Society and in 1871 explored the glaciers of Finland and Sweden. The following year, in Belgium and Switzerland, he came under the influence of socialistic and anarchistic teachings, attached himself to the International Working Men's Association, and became one of its most enthusiastic members. On his return to Russia he held secret conferences among the workmen of St. Petersburg. He was betrayed to the authorities, was arrested, and confined in the military hospital of St. Petersburg, whence, in 1876, he escaped to England. He proceeded in the following year to Geneva, where he became the head and front of the socialistic and nihilistic agitation, and founded its organ, *La Révolte*. Banished from Switzerland in 1881, Prince Kropotkin was arrested at Lyons on a charge of anarchist incitements, and condemned to five years' imprisonment, but was pardoned in January, 1886, and conducted to the frontier. He once more sought asylum in England, where he lived until 1917 when he returned to Russia. He visited the United States in 1900.

Kruger, Stephanus Johannes Paulus (1825-1904), four times president of the South African Republic (1883, 1888, 1893, 1898), was born in Colesburg in Cape Colony, but his father joined in the great trek of 1836, and with his family settled in the Magaliesburg. In 1852 after the death of his father, he accompanied Pretorius to the Sand River. A year later he figured as second in command of Pretorius' expedition organized to avenge the murder of Hermann Potgieter by the Kaffirs. In 1857 a raid was made by Pretorius and Kruger into the Orange River Free State, in circumstances somewhat resembling those of the subsequent Jameson raid into the Transvaal (1895), and with a like ineffective result. Kruger was actively concerned in the civil war (1861-4), on what was called the 'Government' side, and it was largely on his initiative that the negotiations were entered upon which brought the strife to an end, and led to the foundation of the united republic, of which he was elected first commandant-general. The republic was formally proclaimed at Paardekraal, near Krugersdorp, in December, 1880, under a triumvirate consisting of Kruger, Joubert, and Pretorius. In 1883 Kruger was elected president, and by his refusal of the franchise to the Outlanders, he provoked the Jameson Raid. The raid did more than any-

thing else to focus attention on the internal affairs of the Transvaal, and negotiations were entered upon between Mr. Chamberlain, on behalf of the British government, and Mr. Kruger, which only ended in the Boer 'ultimatum' of Oct. 11, 1899. (See SOUTH AFRICAN WAR.) Mr. Kruger sailed from Lorenzo Marques for Europe on Oct. 19, 1900, where he resided till his death.

Krupp, Alfred (1812-87), iron and steel manufacturer, head of the works at Essen in Prussia, was a native of that town. In 1847 Krupp manufactured the first cannon made of cast steel, a 3-pounder, and in the Exhibition of 1851 he showed a 6-pounder steel gun. When the Bessemer process of steel manufacture came into operation in England (1857), with the simultaneous use of the steam hammer, Krupp saw their advantages, and at once adopted both inventions. In 1880 he forged a steel breech-loading gun of 100 tons weight, till then the largest ever cast. The Krupp works are also noted for the manufacture of armor for warships. Krupp introduced the process of carburizing the impact face, thus giving the surface a glass-hardness, which shatters the projectile, the plate neither cracking nor flaking. In 1902 the Krupp works at Essen, Annen, Kiel, and Gruson at Magdeburg employed 43,100 persons, 24,000 of these being in and around Essen. Alfred Krupp was succeeded by his only son FRIEDRICH ALFRED KRUPP (1854-1902), who constructed the 105-ton gun for the defence of Cronstadt, and established the Germania Shipbuilding Yard at Kiel.

Krusenstern, Adam John (1770-1846), Russian navigator and traveller. In 1803 he was entrusted by Alexander I. with the command of a scientific and commercial expedition to the N. Pacific coasts of America and Asia, during which he discovered the Orloff Is., examined and took soundings around the Washington and Marquesas groups, and was the first Russian to circumnavigate the world. In 1810 he published his *Voyage round the World* (Eng. trans. 1813).

Krypton, Kr, 81.8, is a gaseous element existing in the atmosphere. It was discovered spectroscopically by Sir William Ramsay, and is a colorless gas that liquefies at -152°C ., has a density of 4.1, is marked by a brilliant green and yellow line in its spectrum, and is chemically inactive.

Kuala Selangor, seaport at mouth of Selangor, in British protectorate of Selangor, in the Malay Peninsula. Next to Malacca it was the most important stronghold of the

Dutch in the Malay Peninsula. The chief exports are tin, gutta-percha, timber, ivory, hides, salt fish, and rattans; p. 31,000.

Kuban. District in the north Caucasian area of Soviet Russia, includes the valley of the Kuban and the north slope of the Caucasus range as far as eastern Elbruz, and the plains of the lower Kuban and the coast of the Sea of Azov. Agriculture is almost entirely in the hands of Cossacks and German colonists. The mountaineers (Karacnai, etc.) and the nomads of the plains are a pastoral people, and rear horses. Petroleum, coal, and salt are obtained. Area, 36,438 sq. m. The river of the same name, 450 m. long, rises in Mount Elbruz, drains an area of 21,000 sq. m. in n.w. Caucasus, and enters the Black Sea s. of Taman peninsula, and sends one arm n. to the Sea of Azov.

Kubelik, Jan (1880-1940), Bohemian violinist, born at Michle; began to give recitals in 1898; in 1900 made his debut in London, and in 1901-2 and again in 1905-6 toured in the U. S. Possessing phenomenal technical powers, he excels in the rendering of works of virtuosity. In 1903 he married the widow of Count Czaky.

Kublai Khan (1216-94), founder of the Mongol dynasty of China, was a grandson of Jenchiz Khan. While his brother Mangu occupied the Mongol throne, Kublai completed the conquest of N. China, or Cathay, commenced by his grandfather, and on Mangu's death (1259) he became 'the Great Khan.' He subsequently made himself master of the southern provinces of China (1276), and an empire of vast extent, including Tartary, Tibet, Burma, and other countries. Japan, however, defied all his efforts at conquest. Kublai was an able and enlightened monarch, encouraging literature, establishing Buddhism as the state religion, but delighting in Oriental magnificence, which Marco Polo has described in vivid language.

Kuenlun, or **Kwenlun**, a system of mountains forming one of the loftiest ranges in Asia, and constituting the northern wall of the Tibetan plateau. Its general direction is from w. to e.; its length is about 2,300 m. Like the Andes and Himalayas, the main range is continually dividing into several parallel chains. Most geographers, following Richt-hofen, divide it into three main parts—Western, Central, and Eastern. The Western Kuenlin is superficially separated from the Pamir by the valley of the Yarkand Daria, but really has its root in that great knot of the Asiatic mountain systems. The Central Kuenlun en-

closes in its wide ramifications the upland basin of Tsaidam, to the w. of Koko-nor, and is continued e. by the Nan-shan ranges. Some of the greatest rivers of Chinese Southeast Asia, especially the Hwang-ho and the Yangtse-kiang, rise in this part of the Kuenlun.

Kufic, or **Cufic**, Arabic letters or characters, which were by Mohammedan coins and inscriptions, containing only sixteen out of the twenty-eight Arabic consonants.

K'uh-fu, walled city, Shantung, China. About 1-2 m. to the n. is the burial-place of Confucius, who was born in the city. A magnificent temple in his honor is visited by numbers of pilgrims. The ducal residence of the descendants of Confucius is situated within the walls; p. 25,000.

Ku-klux Klan, a secret association founded in the Southern States of the American Union about 1866, during the early part of the Reconstruction Period, for the purpose of preventing the exercise of political rights by the newly emancipated negroes. Its members terrorized the superstitious blacks not only by working skillfully upon their superstitious fears, but also by whipping them and inflicting upon them bodily injury and in many instances death. The organization was at the outset, it appears, made up largely of a class of men who did not countenance the license, violence, lawlessness, and criminality which later characterized it; and the 'klan' undoubtedly contributed much toward restoring to power the class of Southern whites which had been dominant before the war. The 'klan' was investigated by Congress which passed a stringent measure (1871) for its suppression.

Soon after the World War, the Ku Klux Klan was revived in the South and rapidly became a national movement which by 1925 claimed a membership of approximately 9,000,000. The revived organization had definite anti-semitic, anti-Catholic and anti-negro purposes and became the center of acrid controversies in many states. William Cooper Simmons was credited with conceiving the Klan's rebirth, but its moving spirit was Dr. Hiram W. Evans, Imperial Wizard of what was called the Invisible Empire. The Klan bitterly resisted the Presidential aspirations of Alfred E. Smith in the 1924 pre-convention Democratic campaign and was an important factor in the defeat of Smith when he was the Democratic nominee for President in 1928. After that year, the Klan waned and severe laws against its hoods and night rides reduced it to an estimate 9,000 members in 1930. Numerous efforts to rekindle its fervor

continued, but the sporadic burning of fiery crosses on hillsides remained almost the only evidence that Klannishness still survived.

Kulaks, **The**, 'rich peasants' of Russia. The passive resistance of Russian peasants, a majority in population, to Communism caused the Bolsheviks to extend division of classes to the villages in an effort to make Communism desirable. They divided the peasant class into (1) Rich, (2) Middle, (3) Poor. The first group, or Kulaks, was emphasized by the government as made up of 'exploiters'; their property property and grain was to be supervised by a Committee made up of the others. This attempt was, however, sullenly resented. Most of the middle peasants being actually kulaks or relatives of kulaks, village family and economic ties proved stronger than political ideas.

Kulbarga, or **Gulbarga**, chief town of Kulbarga dist., Haidarabad State, India. It was (1347-1432) the capital of Hindu and Mohammedan dynasties, and has ruins of palaces. The citadel contains the great mosque, modeled after that of Cordoba in Spain; p. 29,228.

Kum, chief town of province of same name in Irak-Ajemi, Persia. It contains the tomb of Fatima, sister of Imam Riza, and is a popular pilgrim resort. Next to Meshed it is considered the most sacred place in Persia. Cotton is largely cultivated; p. 20,000.

Kuma, river, Russia, forming the boundary of the Caucasus province on n.e. It rises on the main chain between the Kuban and the Terek, and has a length of c. 400 m.

Kumamoto, city, Kiushiu, Japan. Outside the town is a much-frequented Buddhist temple; p. 61,463.

Kumaun, or **Kumaon**, div., United Provinces, India, consisting of the three districts Naini Tal, Almora, and Garhwal. Tea gardens cover 3,000 acres. Its valuable timber includes Himalayan pine, cypress, and fir, and there are mines (imperfectly worked) of iron, copper, and lead.

Kummel, a liquor imported chiefly from Riga, is produced from bruised caraway seeds cumin, and other flavoring bodies. Grain alcohol is usually the base for this liqueur. It contains about 34 per cent. of alcohol.

Kundt, **August** (1839-94), German physicist, succeeded (1888) Helmholtz as professor of physics in the Berlin Physical Institute, where he remained till his death. His name is principally connected with the dust figures produced by sound vibrations—an investigation that led to his determination, along with Warburg, of the ratio of the two specific heats

of a gas; the method being recently of the utmost value in deciding the nature of the gases helium and argon. His optical work is also of the highest importance.

Kunguer, town, Perm. gov., N.E. Russia. It has copper and iron mines, and carries on Tanning, leatherwork, soap and shoe making, iron-founding, locksmiths' work, farriery, and engineering. It has an important fair. Near the town are famous caverns hollowed out of alabaster, which is quarried.

Kunigunde, St. (d. c. 1030), canonized by Innocent III.; was the daughter of Siegfried, Count of Luxemburg, and the wife of the Emperor Henry II. After Henry's death (1024) she entered a convent, founded by herself at Kaufungen, near Kassel. Her day is March 3.

Kunz, George Frederick (1856-1932), American mineralogist, was born in New York. His knowledge of precious stones secured him the position of chief gem expert for Tiffany in N. Y. City. He served the U. S. government in many capacities as expert and as special agent at world's fairs.

Kuomintang, the National People's Party of China. It was founded on principles formulated by Sun Yat Sen, its first president. His successor was Chiang Kai-Shek.

Kuopio. Province, Central Finland, with an area of 16,500 sq. m., of which only 3 per cent. is under cultivation. Iron is obtained. Also town, capital of above province.

Kura, or **Kur**, river, Russia, the largest of the Caucasus, with a drainage basin of 60,000 sq. m. It enters the Caspian Sea. Below Tiflis it deposits large quantities of silt, and at high water floods the surrounding country. Its chief tributary is the Aras (anc. Araxas).

Kurdistan, the mountainous country stretching s. of Armenia to the plains of Mesopotamia and from the Euphrates e. to Persia. The Kurds number about 1,305,000. The admixture of Turkish, Armenian, and Persian blood has produced a variety of types. Generally they are of middle stature, gracefully and powerfully built, with regular features and abundant hair, brown or occasionally black in color. The Kurds are divided into a large number of small tribes, each governed by a hereditary chief. The majority are Mohammedans. Formerly all were nomads. Those who have taken to agricultural pursuits still often migrate to distant pastures in summer. They keep cattle, goats, and horses, but their chief wealth consists in sheep. Northern and Central Kurdistan include a large part of Turkish Armenia, while Southern Kurdistan reaches to the oil region of Mosul.

Kurgans are ancient sepulchres and grave mounds found in various parts of European Russia and Siberia.

Kuriles, chain of small, volcanic, barren, fog-infested islands, belonging to Japan, and stretching n.e. from the n. of Yezo to the s. of Kamchatka; the chief islands being Kunashiri, Iturup, Paramushiri, and Shamsu.

Kurland, or **Courland**, a province of the Republic of Latvia and formerly one of the three Baltic provinces of the Russian Empire. It has many small scattered lakes, and almost one-third of the surface is covered with forest. Agriculture, cattle-breeding, and sheep-rearing occupy most of the inhabitants. The inhabitants are chiefly Letts, and mostly Protestants; p. 812,300.



Baron Kuroki.

Kuroki, Baron Tamesada (1842-1923), Japanese general, distinguished in the Chino-Japanese war of 1894. In the Russo-Japanese campaign, 1904, as commander of the First Japanese Army, he won the victory of May 1st at Kiu-lien-cheng, thus isolating Port Arthur; and was one of the generals in command at Mukden. See RUSSO-JAPANESE WAR.

Kuropatkin, Alexei Nicolaevitch (1848-1925), Russian general, was born in Pskov. In

the war against the Bokharans he distinguished himself. In the Russo-Turkish war he became Skobelev's chief of staff, and distinguished himself at Plevna. After the death of Skobelev, in 1882, Kuropatkin was engaged in reorganizing the Russian army. In 1890-98 he was governor of Transcaspia; in the war with Japan, 1904, was made commander-in-chief of the Russian army; but was superseded by General Linievitch in March, 1905. He was in command on the northern front in the Great War, and was made governor-general of Turkestan, 1916.

Kurrachee. See **Karachi**.

Kursk, (1.) formerly a province in Central Russia, now a part of Soviet Russia, area, 17, 937 sq. m.; p. 3,000,000. There are many small streams belonging to the basins of the Don and Dnieper. Most of the soil is black earth. Wheat, millet, hemp, tobacco, beetroot are raised. The cattle are celebrated. No part of Russia is more noted for its orchards and honey. (2.) Town, Soviet Russia. The industries include tobacco, soap, tanneries, iron foundries, and flour mills; p. 101,000.

Kuskoquim, second largest river in Alaska, flows s.w. into Kuskoquim Bay.

Kutais, city in Soviet Georgia, on the Rion. There are remains of the golden palace of the kings of Imeritia. Gardening is carried on; p. 48,336.

Kutch. See **Cutch**.

Kuttenberg, industrial town in Bohemia. It has a former royal castle, and manufactures tobacco, sugar, liqueur, cotton and calico; p. 14,799.

Kutusoff, Michael Ilarionovitch (1745-1813), Russian field-marshal, served in the Turkish wars, 1770, 1788-92; and in 1805 commanded an army corps against the French, leading at Austerlitz. In 1812 he was commander-in-chief of the Russian army, and was defeated by Napoleon at Borodino, but defeated Ney and Davout at Smolensk. See *Life*, in French, by Michailovsky-Danielevsky (1850).

Kuvera, the Hindu God of wealth.

Kwang-chau-fu. The Chinese name of Canton.

Kwang-hsu (1871-1908), emperor of China, born in Peking; succeeded to the throne in 1875.

Kwang-si, inland prov. of S. China, borders with Kwang-tung and Tong-king on the s. and Yün-nan on the w. The province has suffered greatly from rebellions and famines.

Kwang-tung, maritime prov. of S. China, borders on the e. with the China Sea, and on the s. with the Gulf of Tong-king. Area, 79,456 sq. m. A rich alluvial soil, heavy rainfall, and good network of waterways, combined with its position at the entrance to the China Sea and with a deeply-indented coast and good harbors, give Kwang-tung great natural advantages. Rice, tea, sugar, silk, porcelain, wood and ivory carvings, furniture, grass mats, paper, and embroideries constitute its chief industries. Oranges, bananas, and sub-tropical fruits, salt and fresh water fish, shell-fish, tobacco and vegetables coal and iron, are among its other products; p. 37,000,000.

Kwanza. See **Coanza**.

Kwei-chau, inland province, China, borders with Sze-chuen on the n. and Yün-nan on the w. Area, 64,554 sq. m. Mineral resources are rumored to be very great, and to include gold, silver, copper, tin, lead, quicksilver, and coal. Besides the Chinese population, there are Lolos in the n.w., Shans in the s., and Miaotzu in the e.; p. 7,650,282. See Hosie's *Three Years in West China* (1897).

Kyanizing. A method of preserving timber by boiling in a solution of bichloride of mercury to destroy the organisms of decay.

Kyōsai, Sho-fu (1831-89), Japanese painter, who excelled in political caricature; this led to his frequent imprisonment during the revolutionary period of 1867.

Kyoto. See **Kioto**.

Kyrie Elëison ('Lord, have mercy'), liturgical phrase used in the worship of the Roman Catholic Church.

L is called a side consonant, because the breath passage is blocked by the tongue in the middle, but not at the side; its channel is the side passages. There are many varieties even of the voiced *l*: for example, the English and French sounds are distinctly different, and three pronunciations of Latin *l* have been distinguished. In English the sound has become silent in many words ('palm,' 'would,' 'walk').

L, as a symbol, is used in numerals for 50, and with a line drawn above it for 50,000; in commerce, when written £, for a pound or pounds sterling in English money.

Laager, South African wagon camp; first adopted for defensive purposes by the Dutch pioneers while traveling through a hostile country.

Laaland, or **Lolland**, Danish island in the Baltic, s. of Sjaelland; area, 444 sq. miles. The coast is much indented, the land relatively low, but very fertile; p. 75,000.

Laar, or **Laer**, **Pieter van** (c. 1613-74), Dutch painter, called 'Bamboccio' and 'Snuffelaer,' was born at Haarlem. He painted chiefly rural fairs and hunting scenes.

La Barca, tn., Jalisco state, Mexico, e. of Lake Chapala, and 60 miles by rail southeast of Guadalajara. It was the scene of two battles during the Mexican war of independence; p. 10,000.

La Barre, **Antoine Joseph Lefèvre de la** (c. 1625-88), colonial governor of Canada. After distinguished service in the French navy against the Dutch and the English, he succeeded Frontenac in Canada.

Labarum, the name given to the imperial standard in the ancient Roman army after the time of Constantine, by whom it was introduced in place of the Roman eagle. See Gibbon's *Decline and Fall*.

Labdacus, in ancient Greek legend, was a king of Thebes, the son of Polydorus, father of Laius, and grandfather of Oedipus.

Label, or **Lambel**, in heraldry, is the mark of cadency of the eldest son. It consists of a fillet, from which hang three short teeth or squares.

Labels, **Plant**, add to the interest and value of most gardens. Where the labels are required only for a short season, soft deal labels are the most serviceable. For permanent use, labels of zinc or lead with raised or depressed lettering, made more conspicuous by means of paint, are the most suitable.

Labeo, **M. Antistius**, a famous jurist in ancient Rome. He is said to have written four hundred books, quotations from which are to be found in Justinian's Digest. See Roby's *Introduction to the Study of Justinian's Digest* (1884).

Labiatæ, a natural order of dicotyledonous plants, a large number of which are remarkable for their fragrance of flower and leaf. The plants belonging to the order, of which there are over 120 genera and 2,500 species, are distinguished by having flowers with irregular two-lipped corollas, the lower lip being three-lobed, four-celled ovaries, single styles, square stems with opposite leaves, and the stamens either two or four in number. Such well known sweet and pot herbs as lavender, sage, mint, marjoram, dead nettle, thyme, savory, and balm belong to this order.

Labiche, **Eugène Marin** (1815-88), French dramatist, was born in Paris, where his first play was produced in 1838. A complete collection of his plays—of which perhaps the best known are *Le voyage de M. Perrichon* (1860), *La poudre aux yeux* (1861), *Le choix d'un gendre* (1869)—was published in 10 vols. in 1878-9.

Labienus, **Titus Atius**, was tribune of the plebs at Rome in 63 B.C., when, in pursuance of the programme of the democratic party led by Julius Cæsar, he prosecuted Rabirius for the murder of his uncle. After 52 B.C. his rank in the army was next to that of Cæsar. When the civil war against Pompey broke out, Labienus deserted Cæsar and took Pompey's side, but proved of little assistance to his new associates. He was killed at the Battle of Munda in 45 B.C.

Lablache, **Luigi** (1794-1858), Italian operatic basso, great alike as an actor and a vocalist, was born in Naples, and there made

his first appearance in opera, 1812, in Fioravanti's *La Molinara*. His greatest creation was Dr. Bartolo in *Il Barbière*.

Labor, in obstetrics, is a term given to the train of events that ends in the expulsion of the child. It may be classified as follows: Abortion, when it occurs before the formation of the placenta—before the commencement of the fourth lunar month. Miscarriage, when it occurs after the formation of the placenta, and before the child is viable—from the fourth to the end of the seventh lunar month. Premature birth, if it occur after the child has become viable, but before full time—before the end of the tenth lunar month. Full-time birth, when it occurs at full term. Delayed labor, when it occurs more than forty-one weeks after conception. A labor is termed normal when the foetus presents by its vertex, the uterine contractions following one another in such a manner that everything is over without artificial aid in twenty-four hours. This train of events happens in about 90 per cent. of labor. The process is divided into three stages—a stage of dilatation, a stage of expulsion or birth of the child, and the after-birth or the placental stage. See OBSTETRICS; PREGNANCY; ABORTION.

Labor, in the science of economics, is defined as human effort directed to the satisfaction of human wants. With land and capital it is classed as one of the three principal factors in production. Karl Marx and other writers, whose sympathies have been identified with the working people, have held that labor is more fundamental than either land or capital, because without labor neither of these factors would have use or value in the first instance. Academic economists today, however, do not attempt to give precedence to any one of the three. Labor has a great variety of functions in the modern industrial world, which may be classified as follows: (1) production of raw materials, as in the process of mining or agriculture; (2) manufacture, or the transformation of the raw material into commodities of value to men; (3) distribution, or the transfer and sale of commodities as determined by human needs; (4) professional service, as that rendered by lawyers, physicians, writers, scientists, teachers, and other highly trained men and women; (5) personal service, as the work of servants, porters, barbers, policemen, and the like.

In common parlance, in modern industry, the word Labor is used to describe the work-

ing classes as a group, in distinction to Capital, which designates the employing group. This classification has a certain rough utility for practical purposes but is somewhat confusing. Labor is undoubtedly different from capital, even in this sense of the term, but capital also labors. 'The employer,' says Seligman, 'is not the same as the employee, but he may work as hard and his contribution to the value of the product may be even more important.' In the writings of the earlier economists the term labor was used to describe primarily the manual workers in industry. With the growth of the Labor Party in Great Britain, however, and the accession to its ranks of many prominent 'intellectuals,' the word has been widened to include workers 'both by hand and brain.' It has been the aim of the Labor Party to emphasize the identity of interest in modern industry between the relatively unskilled laborer and the great mass of more highly trained, salaried workers.

Labor is also classified as 'organized' and 'unorganized.' Organized labor is that portion of the total number of working people who are members of labor unions; the balance are spoken of as unorganized. The word labor as applied to the working classes is historically of recent origin. Prior to the industrial revolution, manufacturing was carried on in the home or the small shop, largely by artisans who also owned the property or the tools with which they worked. Labor and capital were one. With the rise of the factory system, however, the ownership of property and tools came to be divorced from the labor power and lodged in a different group of people. With the separation of capital and labor came a conflict of interest over hours of labor, working conditions, and the share of each in the earnings of industry. The working people began to form unions to bargain more effectively with their employers, and political organizations—such as the socialist, communist and labor parties—to obtain protection and advantage from the state. Since that time labor has become more and more a definite, self-conscious group with recognized aims and status—social, political and legal—in modern society.

Bibliography.—Consult Taussig's *Principles of Economics* (1911); Commons and Associates' *History of Labor in the United States* (1918); Groat's *An Introduction to the Study of Organized Labor in America* (1919); Seligman's *Principles of Economics* (3d ed. 1923); Fitch's *The Causes of In-*

dustrial Unrest (1924); Douglas' (et al.) *The Worker in Modern Economic Society* (1924); Gompers' *Seventy Years of Life and Labor* (1925); *The American Labor Year Book*.

Labor, American Federation of, a federation of labor organizations in the United States and Canada, which includes in the membership of its affiliated unions approximately half of the organized labor in the United States. Affiliated with the Federation are several different classes of organizations. In 1942 it had 45,000 local unions, 49 State federations, 792 city central bodies and 5,482,581 members. The American Federation of Labor is a completely decentralized organization. It exercises no direct control whatever over the policies of its affiliated unions; it cannot call strikes or prevent them, nor can it determine the tactics of any union. The Federation itself, along with the city central bodies, the State federations and the departments, are purely advisory and beneficent organizations: they formulate general principles of labor-union theory and practice, suggest and report upon legislation in the interests of their members, interpret organized labor to the public, aid and encourage the labor press and labor education, furnish financial and moral assistance in strikes, and organize new unions.

Under protection and stimulus of New Deal legislation, the membership of the Federation has increased in the past few years. A general convention of delegates from organizations affiliated with the American Federation of Labor is held annually in October. Samuel Gompers, who had served as president of the Federation for every term except one since its organization in 1886, died Dec. 13, 1924. He was succeeded by William Green.

A jurisdiction struggle between two groups of building trades unions and the question of horizontal vs. vertical unions have disturbed the A. F. of L. in recent years. A vertical union is one which includes all workers in a given factory, whether they be carpenters, painters or machinists. The craft or horizontal union, which has been the traditional form of the Federation, includes only members of a specified trade. Thus, in contradistinction to the vertical union, craft unionism divides the workers in a given factory among carpenters', painters' and machinists' unions. The 1934 convention of the A. F. of L. voted in favor of organizing vertical unions in the unorganized, mass production industries such as

automobiles and steel. Representatives of some of the craft unions who stand to lose jurisdiction over large number of workers were accused early in 1935 of obstructing this new policy. The culmination of these dissensions came in 1935, when John L. Lewis headed the factions favoring vertical unions in forming the C. I. O. (now the Congress of Industrial Organizations). This great rift in labor unionism has since continued to widen despite efforts of President Roosevelt, including the fruitless conference of 1939, to heal the breach.

The large measure of general dissatisfaction caused by the activities of the National Labor Relations Board has been shared by the A. F. of L., whose executive council has attacked its decisions, charged it with fostering C. I. O. interests, and called for amendment of the N. L. R. Act. In mid-1939 the C. I. O. also began criticising the law.

The American Federation of Labor publishes a monthly magazine, *The American Federationist*. Permanent headquarters are in Washington, D. C. See LABOR ORGANIZATIONS; TRADE UNIONS. Consult the publications of the Federation, especially the annual *Report of the Executive Council*; also Gompers' *Labor and the American Welfare* (1919); *The American Labor Year Book* (annual); Beard's *A Short History of the American Labor Movement* (rev. ed. 1924).

Labor Colonies, colonies instituted in various countries by the state or by private philanthropy, with the objects of assisting unemployed workmen and of reducing vagrancy. In Germany they have existed for many years, and are part of the regular means of assisting the traveling unemployed. Switzerland has compulsory labor colonies for vagrants, as at Witzwyl, and voluntary labor colonies for those who are destitute through no fault of their own.

Labor Day, a legal holiday in the United States, observed on the first Monday in September, and celebrated by labor processions, sports, and meetings. Since the Labor Congress at Berlin, 1890, the first of May has been dedicated to labor demonstrations in European countries.

Labor Disputes. See Arbitration, Industrial.

Laborer, a term legally capable of various meanings, according to the context in which it is found. In some cases it may include any servant, not merely one who performs manual work; in others it denotes only the latter; while in others, again, it may be used

in the restricted sense of an unskilled manual worker.

Labor Exchanges. See **Unemployment.**

Labor, Hours of. In the earlier and simpler stages of modern industrial development individual workers set their own pace and chose their own hours of work. The development of machine production and the application of steam and artificial light to manufacturing changed conditions. The workers left their homes for the towns, to become factory employees. The sharp demarcation between day labor and night rest was broken down, and in other ways the workers were subject to the will of powerful employers. In the long struggle that ensued for a more humane work day, the workers have succeeded, first, in establishing a day of definite length for a day of indefinite length, and, second, in shortening the labor day. These improved conditions have taken place gradually and progressively with the general increase of the nation's wealth, the changes, advancements and spread of the benefits of the times and with more enlightened public sentiment. Akin to the movement for the shorter work day, and parallel with it, have been movements for the six-day week, for the Saturday half holiday, for annual holidays, as Labor Day, and for vacation periods with pay.

The United States has had a ten-hour movement and an eight-hour movement. Until recently, hour regulation in the United States has come mainly through State legislation. The laws of the forty-eight States, however, exhibit a wide variety in the working hours of women and children. Since the advent of the New Deal there has been federal legislation covering fields previously regarded as entirely within the scope of State legislation. A federal law enacted in 1938 is the so called Fair Labor Standards Act, which provides for a maximum week of 44 hours and a minimum wage of 25 cents per hour, to develop progressively to 40 hours and 40 cents respectively. This law creates a Wage and Hour division in the Department of Labor, headed by an administrator upon whom is conferred power to step up minimum wages of employees of concerns engaged in interstate commerce or in producing goods for shipment in interstate commerce. This law also contains provisions under which goods may not be shipped in interstate commerce in case of oversight in observance of the mandates of the administrator. England and her Anglo-Saxon colo-

nies, notably Australia, have developed considerable regulation of hours of labor by law largely to shorten working hours for the benefit of workers of all classes, particularly women and minors. The history of the betterment of conditions of British labor is a long one, and results were achieved only by slow stages and persevering efforts.

In 1802 the British Parliament passed the first factory bill modifying the industrial slavery imposed upon children employed in factories as apprentices. By 1833 the working day of women and minors in all manufacturing establishments had been reduced, by progressive steps, to ten hours. The ten hours' legislation by 1840 was generally adopted as the normal work day in the larger towns. In 1846 the stone masons started the nine-hour movement, and by 1874 the nine-hour day was quite general. The eight-hour movement, driven forward by the militant campaign of the latter part of the nineteenth century, was adopted between 1889 and 1897 by all government dockyards and workshops, and by a majority of London bookbinding and engineering establishments. Before 1906 most of the Continental nations of Europe had prohibited night work by young factory workers and had limited their hours of day work. In 1913 and 1914 international conferences were moving to strengthen the night rest requirements for young persons and to establish a maximum ten-hour day for youth and women. The Great War halted these efforts. In Asia, Africa and South America, hour regulation is in about the same stage as it was in America and England a century ago.

The Labor Section of the Versailles Peace Treaty recommended the world-wide adoption of the eight-hour day and of one day of rest in seven. In accordance with the peace treaty, the International Labor Conference at Washington in November, 1919, formulated draft conventions for a universal eight-hour day, effective July 1, 1921, and for night rest periods of eleven hours for women and young persons, effective July 1, 1922. In England and America laws limiting the hours of labor were dead letters for a long period after enactment, for want of enforcement. Amendments to the laws have in part corrected this defect by providing for efficient and adequate corps of factory inspectors and by compelling employers to post publicly the hours of their employees.

The length of the working day has a direct connection with production. Experience has proved that reductions from a longer

work day to the ten-hour day and from the ten-hour day to the eight-hour day have not only not often been accompanied by a reduction of output, but have actually in numerous instances been accompanied by surprising increase. The explanation of this outcome of hour reduction lies both with the employer and the employee. The employer improves his equipment and management, which lessens the breakage and stoppage of machinery. The short-hour workers are more alert mentally and have more vitality, ability, and resources to put into their work because of an adequate period in which to recuperate from industrial fatigue and to enjoy life.

Labor Legislation in the modern world is of two kinds: protective and definitive. Protective legislation is designed to guard the working man and woman against various abuses in the conduct of industry; definitive legislation determines the legal status of labor in the modern world—its rights and obligations in relation to its employers and the public. Protective legislation can be further classified into factory laws which concern the regulation of conditions in the workshops and social legislation of a more general character. Factory laws are of two kinds: those which relate to the physical conditions of buildings and other structures used in manufacturing, mining or transportation, and those which concern conditions of employment.

The first law requiring factory safeguards in the United States was passed by Massachusetts in 1877, and was modelled upon a mass of such legislation which had grown up in England with the rise of the factory system there. Practically every State in the union now has such laws on its statute books. Laws providing for sufficient ventilation in factory buildings have been passed by over half the States. Wet cleaning methods, the use of respirators, and separate lunch rooms are also often provided for. In safety and health legislation of this sort a distinct tendency has been shown to single out women for special protection, on the grounds of their physical handicaps.

Labor on American railroads has been protected from accidents largely by the Federal Government acting by virtue of its constitutional power to regulate interstate commerce. Power was given to the Interstate Commerce Commission to designate the number, dimensions, location and manner of application of safety devices on railroads. States have also enacted safety legislation to protect railroad

labor and workers on street and electric lines. Apart from the laws which prescribe certain physical conditions for the protection of labor in industry, a wide variety of statutes have been passed which deal with conditions of employment to the same end. These may be classed as regulatory and prohibitive. Chief among the regulatory laws have been those which limit hours of labor. These vary in respect to men, women, and children. The main obstacle to the enactment of this legislation has been the attitude of the courts, which have usually held that a limitation of men's hours violates the clause in the Federal Constitution prohibiting the States from passing laws which interfere with liberty of contract. Only when social welfare clearly allows an exception to this rule as an exercise of police power have the courts allowed such statutes to stand. See **LABOR, HOURS OF**. Laws regulating the wages paid to working people may also be classed among those dealing with conditions of employment.

However, the United States Supreme Court as more recently composed has upheld several congressional enactments of questioned constitutionality among which are the so-called Fair Labor Standards Act, of 1938, and now hours and wages are under federal regulation. See **MINIMUM WAGES**.

Prohibitory laws dealing with conditions of employment exclude completely either certain persons from employment under specified circumstances or certain materials from use in specified industries. Child labor laws are the most important of those dealing with persons.

Protective legislation of a general social character includes those laws which provide what is commonly called 'social insurance': insurance against industrial accidents, ill-health, old age and invalidity, and unemployment, and insurance for widows and orphans. First put into operation in Germany in 1885, workmen's compensation acts have since been passed by over forty foreign nations. It was not until 1914, however, when the New York law was passed, that these statutes began to be enacted in the United States. Since then almost every State has provided for compulsory compensation for workmen who have been injured in the course of their employment. The Federal Government also has a law which covers its more than 750,000 civilian employees.

Health insurance, providing a source of income to workers during illness, has not been accepted as widely as the other forms of so-

cial insurance. One form of it, however—insurance to protect women during idleness required for child-bearing—has been adopted widely in the United States through co-operation between the Federal and State governments. The facilities of the Sheppard-Towner act, by which the Federal Government advances dollar for dollar to States providing maternity benefits, has been accepted by a majority of the States. Compulsory old-age pension laws have made great headway in foreign countries although they were somewhat slower in developing than other forms of social insurance. During the years of 1933 and 1934 they gained favor rapidly and have since been adopted by many States. State aid in form of pensions for widowed mothers with dependent children has been provided by law in several European countries. Such laws have also become exceedingly popular in the United States, and have been adopted in practically all of the States.

Unemployment insurance made compulsory by law has been in effect in England since 1912, and in Italy since 1920.

In the United States, the continued unemployment of millions of workers revived moves for federal legislation (1930-35) and the states of Wisconsin and New York enacted insurance plans.

In 1935 was passed the Social Security Act, a Federal measure which provides for old age insurance supported by pay roll taxes paid by both employers and employees in certain branches of employment, the eligible beneficiaries of which are to receive monthly retirement benefits from the insurance upon retirement after reaching the age of 65 years, according to the prescribed conditions. The act also provides for unemployment compensation under a method of State co-operation. Other provisions of the act apply to old age assistance plans; public assistance; aid to the blind; aid to dependent children; maternal and child welfare; maternal and child health service; services for crippled children; child welfare services; public health services; and vocational rehabilitation. This act is very broad and comprehensive, and far reaching in its effects and coverages, and particularly so where there is co-operative State legislation. Since its enactment most States have passed laws to enable them to obtain the benefits held out to them by the provisions of this act. In 1939 the Social Security Act was amended to increase amounts of retirement benefits and advance date of payments of same in many cases.

The regulation of employment agencies, however, has been undertaken by almost every State in the union, in order to eliminate exorbitant fees and the misrepresentation of conditions.

A vast program was enacted by the Federal Congress (1933) of which the National Industrial Recovery Act was one of the most important items. This Act, generally known as NRA, provided for the adoption of industrial codes which specified the maximum hours of labor and minimum wages in each division of each industry for which a code was made; it also included other regulations regarding conditions of employment. Subsequently many States passed supplementary legislation.

The NRA, never entirely understood by most people, if by any, did not come into full operation before it was cast out by the United States Supreme Court in May 1935. Its rejection seemed to remove a load of oppression from puzzled, groping, threatened industry, and an upward turn from the depression became definitely apparent. But the New Deal was not through and evidently not ready for the return of prosperity, for later was passed the National Labor Relations Act, which had the backing of the labor union overlords. Following its passage, the agitators were turned loose and strikes fomented in various industries, attended by some of the most disgraceful and destructive occurrences in the annals of American industry. A new technique, borrowed from France and known as the "Sit Down Strike," was adopted. The strikers and their riotous friends defied law and order, and shamefully abused their fellow employees who chose to continue working, and then drove management from the factories, of which they took charge and refused to vacate, meanwhile wreaking destruction on valuable machinery and partly finished products, as well as on the buildings. The effect of these strikes on business, generally, was demoralizing. The substantial progress toward recovery which had taken place during the previous 18 months was wiped out and the return of prosperity indefinitely delayed, and a direct immediate result was the placing of a horde of these strikers on the already overburdened relief and WPA rolls, to be there supported from taxes paid by the workers whom they had so brutally assaulted and by the owners of the plants which they had so maliciously damaged. See UNITED STATES, NEW DEAL; MINIMUM WAGES; LABOR, HOURS OF.

Consult *Bulletins* of the United States Bureau of Labor Statistics on Labor Legislation; *American Labor Legislation Review* (quarterly). See UNITED STATES—NEW DEAL; MINIMUM WAGES.

Labor Legislation, American Association For, founded in 1906 approaches social problems from a social point of view. Representatives of employers and employees, public officials, economists, social workers, personnel workers, and others interested in social welfare, comprise its membership. Its program includes stabilization of employment and effective administration of labor laws, social insurance, and all measures designed to improve general laboring conditions.

Labor Organizations, as the term is commonly used, are voluntary groups of working men and women formed to secure more effectively than is possible by individual action an improved status in society: higher wages, shorter hours of work, more satisfactory shop conditions, greater control over the management of industry, and insurance against the hazards of life and labor. A broad division of labor organizations may be made into those which are designed primarily to gain their ends by 'direct action' within the industrial field—by collective bargaining with employers, with or without formal agreements, or by striking; and those which are formed to accomplish the same end through 'political action'—by the election of representatives to legislative, executive, and judicial office in the government. The former are usually called labor unions and the latter labor parties.

Labor unions have been carried to a high degree of organization in the modern world both within each nation and on an international scale. Two main groups of unions may be distinguished by their policies and tactics: the pure and simple trade unions and industrial unions. The former include in their membership only those workers who are engaged in a similar trade or occupation—by far the largest group in numbers; the latter include all the workers in every occupation in each industry regardless of craft or occupational lines. In the United States, and to a somewhat lesser degree in other countries, the pure and simple trade unions have been relatively conservative in their policies; the industrial unions, radical. The trade unions have confined their activities largely to the immediate concerns of the factory or shop—wages, hours of labor, and working conditions: the industrial unions have concentrated

their attention more on the ultimate goal of complete ownership and control of industry by the workers themselves. This they hope to achieve by refusing agreements with employers and by striking for better conditions and greater control until the final act of revolution is accomplished by the 'General strike.' While few trade unions have developed a more radical philosophy and program, some industrial unions are highly conservative.

In the United States and Canada the more conservative trade unions have been organized into over 125 'national or international' unions which often include in their membership hundreds of 'local unions' in both countries in each particular trade or industry. The locals and the internationals form closely coordinated units for common action on a national scale with a considerable measure of power and control over local affairs lodged in the 'international officers.' Most of these national unions, in turn, are bound together in the American Federation of Labor. The same sort of pyramidal organization of labor unions is common to other nations. The various groups of labor unions in the different countries have formed five leading international organizations in existence today: the International Federation of Trade Unions, formed in 1901 with headquarters in Amsterdam; the Red International of Labor Unions, formed in Moscow in 1921; the International Workingmen's Association, formed in 1922, with headquarters in Berlin; the International Federation of Christian Trade Unions, organized in 1920, with headquarters in Utrecht; the Pan-American Federation of Labor, formed in 1918, with headquarters in Washington.

Labor organizations in the political field can be divided into three main groups: labor parties, socialist parties, and communist parties. Labor parties are usually built upon existing labor union bodies, and their program is usually reformist rather than revolutionary. Socialist parties are usually made up of individual members organized into various locals in population centers. Their program has for its ultimate aim the public ownership and democratic management of the basic industries, to be achieved by constitutional means through legislative action. Communist parties are also organized on the basis of individual membership, but have a more frankly revolutionary program aiming at proletarian revolt, a dictatorship, and the complete elimination of private capital and 'the bour-

geois state.' No labor party on a national scale has been organized in the United States, in spite of sporadic and local attempts, the most important of which has been the Farmer-Labor Party. The strength of these labor political groups in foreign countries has been far greater. The Communist Party controls the Russian government, the Socialist Party has for years been the largest single group in the German legislature, and the Labor Party in Great Britain carried on the government for a time under the premiership of J. Ramsay MacDonald. Socialist legislators in almost every foreign country form a substantial minority bloc and during the past few years a considerable number of communists have been elected to foreign legislatures.

In contradistinction to conservative and liberal parties in the modern world, both the socialist and communist groups have a well-established international organization. The Labor and Socialist International, organized at Hamburg in May 1923, by the Second and Vienna Socialist Internationals, is the lineal descendent of the original international organization founded by Karl Marx in 1864. Affiliated with it are 43 socialist and labor party groups in 33 countries, including the United States, with a total membership of about seven million. Bitterly opposed to the Socialist International is the Communist International, with which were affiliated until 1943 the communist parties in 45 countries. Its headquarters was in Moscow and it was dominated by the Russian communists. Consult *The Labor Year Book* and *American Labor Year Book*, publications of the American Federation of Labor; Carlton's *Organized Labor in American History* (1920); Cole's *The World of Labor and An Outline of the British Labor Movement* (1924).

Labor, U. S. Department of, one of the ten departments of the Government, having at its head a secretary with a seat in the Cabinet. Its object is to promote the welfare of the wage earners of the country. It consists of the Bureaus of Labor Statistics, Immigration, Naturalization, the Children's Bureau, the Women's Bureau, the Conciliation Service, and the U. S. Employment Service. The Department was created by Act of Congress, effective March 4, 1913, which separated the former Department of Commerce and Labor into the Department of Commerce and the Department of Labor.

Labouchere, Henry Dupre (1831-1912), English journalist, born in London. He founded, 1876, and became proprietor and

editor of *Truth*, a society journal, which exposed all kinds of charlatany and fraud. As a paragraph writer, no journalist of his time could approach him for pith, point, and lucidity; as a parliamentarian, he is remembered for his racy speeches, his aggressive Liberalism, and his action as member of the Jameson Raid Commission, 1896.

Labrador, a dependency of Newfoundland, extends from Blanc Sablon, at the southwest entrance of the Strait of Belle Isle, to Cape Chudleigh, at the eastern entrance of Hudson Strait. It is bounded on the northeast by the Atlantic Ocean; on the e. by the Strait of Belle Isle; on the southwest by Ungava or New Quebec; and on the w. by Ungava Bay. The coast is rugged and forbidding, but is deeply indented with numerous bays and inlets, which form generally excellent harbors. The coast is dotted with many islands; but they rise so sheer from the water that they are not dangerous to navigation in clear weather. The scenery along this huge gap in the coast is magnificent. The winters are extremely cold. The summer, which lasts from June to the middle of September or the beginning of October, is charming. The rainfall is heavy in summer, and the snowfall is equally heavy in winter. For the most part, there is no soil at all, or the summer is too short to make it of any use. This is not true, however, of the river bottoms and along the inlets for some distance from the coast. In these places potatoes, Dutch turnips, cabbages, and other hardy vegetables are grown successfully.

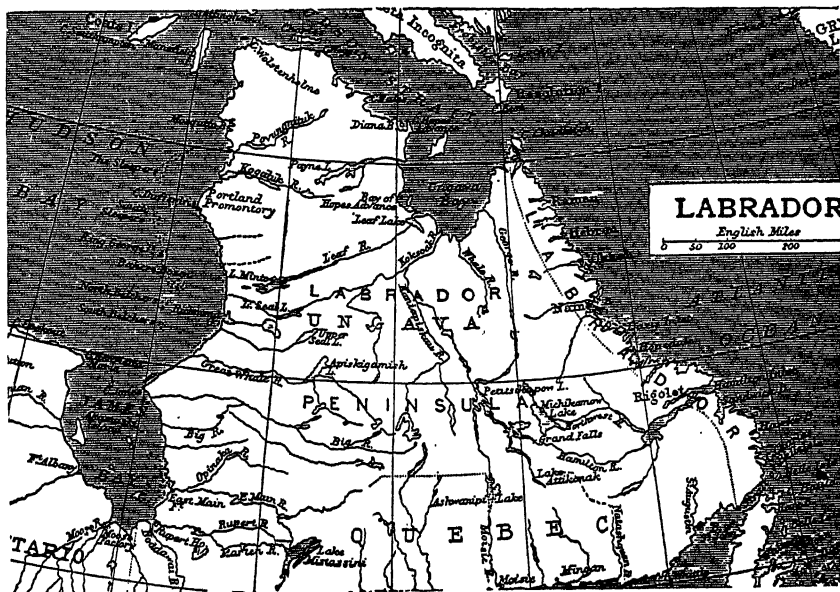
Little is known about the geology of the country. The prevailing formation on the coast is granite, gneiss, or mica slate; above which, in some places, are beds of Old Red Sandstone and a stratum of secondary limestone. Where the surface has not been burned, caribou moss covers the rocks. In the interior the usual wild berries grow in abundance. The shores of some of the inlets are heavily forested with spruce, birch, poplar, pine, etc. At some distance from the coast, caribou are numerous; the usual fur-bearing animals—bears, wolves, foxes, martens, otters, beavers, lynxes, and others—are found; while the rivers and inlets teem with trout, salmon, etc. Ducks and geese afford excellent shooting. The heavily wooded region is found at and near Hamilton Inlet—about fifty miles from the coast. All this part of the country is covered with excellent timber. Labrador is chiefly noted for its fisheries. The shallows near the coast are the resort of countless

schools of cod, and it is there that the hardy fishermen of Newfoundland and Labrador reap the rich harvest of the sea. In May of each year many Newfoundland fishermen leave for the fishing grounds of Labrador. In October the fishermen, to the number of about 15,000, return to their Newfoundland homes.

There is no mining. Labrador may be reached in summer by steamship from St. John's, Newfoundland. Government boats touch at the various ports with the mails. In Labrador itself summer travel is by water, winter travel by dog sleds. Labrador con-

Basque fisherman, who settled in the bay of that name about 1520. For many years France held a strong post at Bradore to protect her fishermen. In 1760 the French abandoned the country. It then came under the jurisdiction of Canada, then of Newfoundland, then of Canada again, and finally of Newfoundland (1809). Consult Grenfell's *Labrador, the Country and the People* (1910); W. C. Gosling's *Labrador—Its Discovery, Exploration, and Development*.

Labrador Duck, an extinct species, of which the last known specimen was captured in 1871. The customary range was n.



tains a resident white population of about 3,500, called 'livyers.' The Eskimos number about 1,500; while the Indians form a small shifting population. North of Hamilton Inlet the Eskimos have been Christianized by Moravian missionaries. The whites are a very devout people. Their religious as well as their physical needs are cared for by Dr. Grenfell and his associates. He started his work in Labrador in 1892, under the auspices of the Royal National Mission to Deep-Sea Fishermen. Labrador is governed directly by Newfoundland. The country itself has no settled form of government, justice being dispensed by the medical missionaries, who are also made justices of the peace. Labrador is said to have received its name from Bradore, a

from Labrador; but in winter these ducks were occasionally found off the coasts of New England, Long Island, and New Jersey.

Labradorite, one of the commonest of the soda-lime feldspars or plagioclases, found in many crystalline rocks, such as basalt, gabbro, andesite, and diorite. It occurs in abundance on the coast of Labrador, and is not uncommon in Northern New York and Canada.

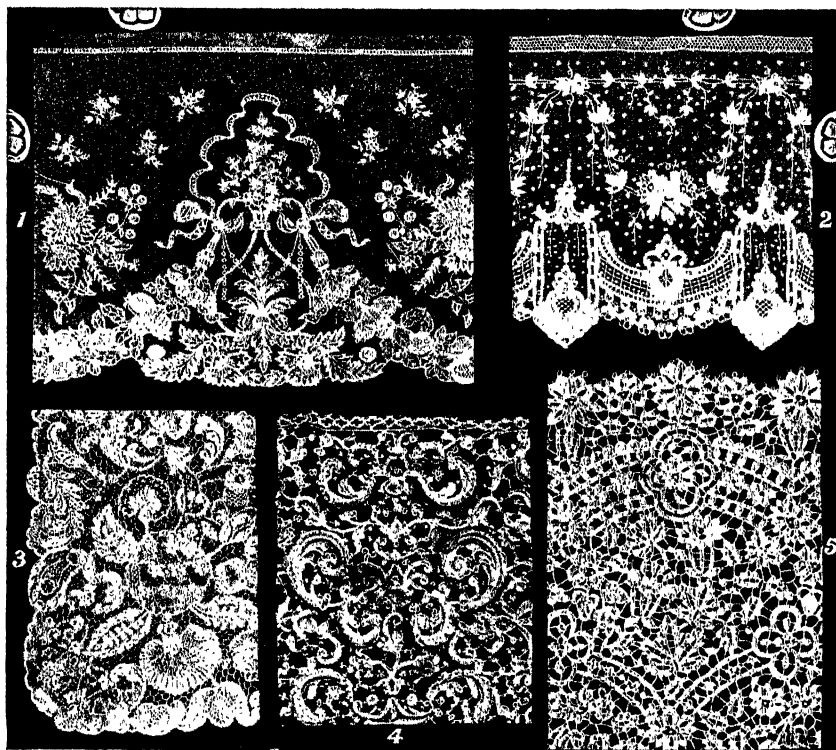
La Bruyère, Jean de (1645-96), French writer, was born in Paris. A man of retiring and studious disposition, La Bruyère has recorded his observations in *Les Caractères de Théophraste, traduits du Grec, avec les Caractères ou les Mœurs de ce Siècle* (1688). He continually revised and augmented it, and as

many as nine editions had appeared up to the year of his death. Consult Fournier's *La Comédie de la Bruyère*; Satine-Beuve's *Portraits Littéraires*; Morillot's *La Bruyère* (1904).

Labuan, Island, 6 m. off the n.w. coast of Borneo; area, 35 sq. m. The island, British from 1846, was in 1905 made a deputy governorship under the Straits Settlements; p. 3,872. Seized by the Japanese in 1942.

of intricate chambers or passages. Of these the most celebrated were the Egyptian and the Cretan.

Labryinthodonts, or *Stegocephali*, a race of extinct Amphibians, the remains of which are found in the Permian, Carboniferous, and Triassic strata. The name Labyrinthodont refers to the mazy pattern exhibited on a transverse section of the teeth of some genera.



Examples of Lace from the South Kensington Museum, London.

1, Limerick, 1387; 2, Point d'Alencon, French, 19th century; 3, Point de France, late 17th century; 4, Point de Neige, Venetian, 1670-1680 A.D.; 5, Carrickmacross, late 19th century.

Laburnum, a genus of handsome, hardy, leguminous trees, natives of the Alps and other mountains of Southern Europe. It is much planted in shrubberies and pleasure grounds on account of its glossy foliage and its large, pendulous racemes of yellow flowers, which are produced in great abundance in May and June.

Labyrinth, the name of some celebrated buildings of antiquity, consisting of a series

Lac. See **Lakh**.

Lac, a resinous incrustation found on many kinds of twigs in India, Burma, Siam, China, and some East Indian islands, caused by a small insect called *Tachardia lacca*. The lac-bearing twigs are cut into pieces three to six inches long. Lac cultivation is extended by the attachment to suitable trees of twigs bearing impregnated insects. The red liquid in the mother cell, if removed before swarm-

ing takes place, yields lac dye, now largely supplanted by aniline dyes. Lac is also the basis of shellac.

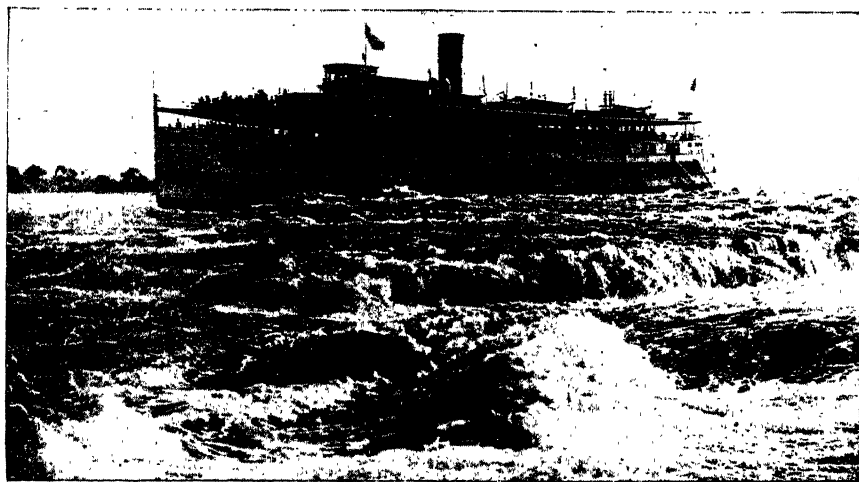
Lacaille, Nicolas Louis (1713-62), French astronomer, was born in Rumigny. He was the first to determine accurately the length of an arc of the meridian. While on a visit to South Africa he determined the position of upward of 10,000 stars, resulting in his *Cælum Australe Stelliferum*.

Laccadive Islands, a group of fourteen coral islands in the Indian Ocean, only nine of which are inhabited. They belong to Great Britain, and lie about 200 m. w. of the Malabar coast. Coconut is the chief plant, and coir, coconut fibre, is extensively manufactured. Total area, 744 sq. m.; p. 13,633.

linen thread, and generally are of much greater delicacy than those made by machinery, which are usually of cotton.

An early form of lace was 'cut work,' the fashionable employment of ladies in the 16th century. Certain pillow-made laces claim the prefix 'point'—thus, 'Point de Malines,' 'Point de Valenciennes.' Point also means a particular stitch, as 'Point de Paris,' or 'Point de Neige.'

Most of the best-known laces derive their names from the place of origin, or district most renowned for their production, as Brussels or Brabant (sometimes called 'Point d'Angleterre'), Venice point, and rose or raised Venice point, Valenciennes, Mechlin or Malines, Languedoc, and many others. The prin-



Courtesy of Canadian Pacific.

Steamer descending Lachine Rapids.

Laccolith, or **Laccolite**, a lens-shaped intrusion of igneous rock which arches up the strata above it.

Lace, an ornamental fabric of linen, cotton, silk, or gold and silver threads, made by looping, knotting, plaiting, or twisting the thread into definite patterns of contrasted open and close structure. There are three kinds of lace: needle point, made by the needle; pillow lace, made on the pillow by means of a number of bobbins; and machine lace. Both kinds of hand-made lace are produced on a parchment pattern. Needle or point lace is closely allied to embroidery; pillow lace is an elaboration of plaited fringe work; and machine lace is a development of fancy weaving. Hand-made laces are composed of fine

cipal exception to this rule is 'guipure,' characterized by a raised thick thread prominently and effectively disposed in the outline of the pattern. This thread is composed of a core of inferior material, such as cotton, covered with a superior material, as silk, or gold or silver thread, the complete cord being called guipure. The term 'guipure' is now applied to many celebrated makes of lace where a raised effect is produced by similar means to the above. Lace, or more correctly lace-net, making by machinery dates from 1768, when a loop net was produced in saleable quantity by a development of the stocking-machine.

The warp machine (1775) was so much improved by the year 1810 that it was mak-

ing nets and fabrics which are still in demand. The principle of the machine is that of crochet fabric, as made by hand with the crochet-hook. Though the warp machine was so useful, there was still required a machine to make a twist net—that is, to manipulate the threads by mechanical means so that they should twist round one another. The twist-lace machine not only makes the threads twist round one another, but, by dividing them into two thread systems, also makes them traverse. The machinery used in the various departments of the lace trade varies mechanically according to the particular purpose for which it may be required, but the fundamental principle remains the same. The traverse bobbin net machine was invented by John Heathcote in 1809-11, and the Lever's machine by John Lever in 1813. Consult Felkin's *History of the Machine-wrought Hosiery and Lace Manufactures*; Beebe's *Lace, Ancient and Modern*; Palliser's *History of Lace*; Moore's *The Lace Book*; Jourdain's *Old Lace*.

Lacebark, the popular name given to three species of West Indian trees, which constitute the genus *Lagetta*, a subdivision of the order Thymelæaceæ. Its chief interest, however, is in the inner bark, which, when macerated and stretched laterally, resembles coarse lace.

Lacedæmon. See **Sparta**.

Laceleaf. See **Lattice Leaf**.

Lacertilla. See **Lizards**.

La Chaussée, Pierre Claude Nivelle de (1692-1754), French dramatist is often cited as the originator of the 'comédie larmoyante,' from which the modern French drama took its origin. Among his plays are *Mélanide* (1741), *Amour pour amour* (1742), *L'Ecole des mères* (1745), *La gouvernante* (1747), and *L'Ecole de la jeunesse* (1748).

Laches, in the equity system of England and the United States an inexcusable delay in the protection of one's legal rights.

Lachesis. See **Moiræ**.

Lachine, town, Quebec, Canada, in Jacques Cartier co., on Montreal Island; at the head of Lachine Rapids, which are usually navigated by steamers on the seaward trip, and which supply electric power for Montreal. Lachine canal, constructed to avoid the rapids, connects the town with Montreal, and is the main highway of commerce; p. 15,404.

Lachish, a Philistine city, noticed on monuments about 1500 B.C., as taken by the Abiri. The site is a large mound at Tell el-Hesi, 16 m. e. of Gaza. Here eight cities were

excavated one above the other, and remains of early date were discovered. Lachish is frequently mentioned in the Old Testament. The town is now deserted. Consult Petrie's *Tell el-Hesi*; Bliss' *A Mound of Many Cities*.

Lachrymal Glands and Duct. See **Eye**.

Lacinaria, (*Liatris*), a genus of hardy perennials of North America belonging to the order Compositæ, sometimes known as Blazing Star or Button Snake Root. They bear racemes of purple or white flowers, and the leaves are narrow and entire. Many are desirable garden border plants, thriving in ordinary garden soil.

Lacinium, a promontory in Southern Italy, in the district anciently called Bruttium, now Calabria, a few miles s. of the site of the ancient city of Crotona. On it stood in ancient days a famous temple in honor of Hera Lacinia.

Lackawanna, city, New York, Erie co.; is the seat of the St. Johns Protectory and has a home for orphans, the Moses Taylor Hospital, Memorial Hall, and South Park; p. 24,058.

Lackawanna, river of Pennsylvania, rises in Susquehanna co., in the n.e. corner of the State, and flows s. and s.w. to join the north branch of the Susquehanna at Pittston.

Laconia and Laconica. See **Sparta**.

Lacordaire, Jean Baptiste Henri Dominique (1802-61), the greatest of modern French pulpit orators, was born in the department of the Côte d'Or. He preached for years in the Dominican habit at Notre-Dame and in many other French churches, attaining an immense reputation as a pulpit orator, with the result that the Dominicans of France were formed into a regular order, with Lacordaire at their head.

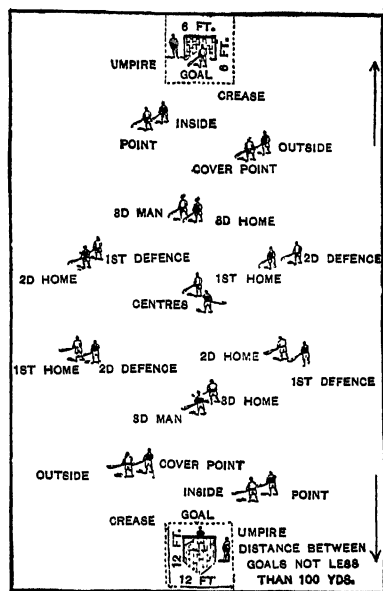
Lacquer, a varnish prepared by dissolving shellac in alcohol, with or without the addition of coloring matter and other ingredients. Ornamental or useful articles of brass are usually lacquered to preserve the surface from discoloration or corrosion. Iron, tinplate, and other metals and alloys are also sometimes lacquered. The lacquer used is an alcoholic solution of shellac, colored with turmeric, dragon's blood, gum sandarac, or aniline dye, and applied to the slightly warmed article and dried by heat. The lacquer used for the celebrated ware of Japan and China differs entirely from that used for brass. The body of this ware is of wood, and the lacquer or varnish with which it is coated is prepared from the juice of certain trees, which, after purification and admixture with pigments

and other substances, forms an almost imperishable varnish.

Lacroix, Sylvestre François (1765-1843), French mathematician, was born in Paris. He introduced the simple notation now employed in the integral calculus.

Lacroma, islet, Dalmatia; was a favorite residence, of the Archduke Maximilian, afterward emperor of Mexico, and of the Crown Prince Rudolph. Richard Cœur-de-Lion, on his return from the Crusades in 1192, landed here.

La Crosse, city, Wisconsin, county seat of La Crosse co., on the Mississippi River, at the mouth of the La Crosse and Black Rivers. The leading industries are rubber mills and foundries, and manufactures of farm implements, oil and gasoline gauges, cigars, knit goods, clothing, brooms, and lumber and dairy products; p. 42,707.



The Game of Lacrosse.

Lacrosse, a field game played with a ball and a long stick (5 or 6 ft.) of light hickory, bent at the top like a bishop's crozier, on account of which it was christened 'la crosse' by the French-Canadian settlers. The origin of the game is probably Indian, but the credit of popularizing and codifying it as a white man's game belongs to the Canadians. The Canadian whites effected many changes in the manner and method of playing the game.

The Montreal Club was the first of any prominence in Canada, the National Amateur Lacrosse Association, now in existence, being formed in 1885. The United States Association was formed earlier, however, in 1882, although it died out in a few years. The game was revived in the United States in 1891.

A team is composed of 12 men, which are lined up as follows: Goal keeper, point, cover point, first, second, and third defence; center, third, second, and first attack; outside home, inside home. The opposing team is lined up along the field from goal to goal opposite the other in reverse order, inside home being opposite point, and so on down the field. There is no arbitrary rule governing the placing of players at the start of the game, but the method given is the one generally adopted. The game is started by the referee placing the ball on the ground in the middle of the field within a circle having a radius of 6 ft., the two opposing centers placing their crosses on each side of the ball. No player on either side can come within 6 ft. of the two centers until the ball has been knocked clear of the pocket in which it is held by the crosses. As soon as the ball is out of the pocket players on either side may get it and throw it from player to player, or run with it in the cross in the effort to get near enough to the opponents' goal to throw it in and score a point.

Certain kinds of body-checking are permitted and penalties are provided for others. Punishments are suspensions for certain periods of time during the game when no substitute may be put in, and sometimes for the whole match. Free throws or runs for the goal are also allowed on fouls. A match in the United States consists of two thirty-minute halves with an intermission of 10 minutes, unless otherwise ordered by the captains of both teams, while in Canada the time of play is an hour and a half. The side scoring the greatest number of goals in the stated time of play is the winner. Consult W. C. Schmeister's *Lacrosse* (1905); R. H. Barber's *School and College Sports* (1905).

Lacryma Christi, a famous Italian wine made from a special Muscat grape grown on the farms of the monastery Lacryma Christi, which is situated on the lower slopes of Mt. Vesuvius. The grapes are also used as table raisins. Much of the Lacryma Christi of commerce is a second-rate wine coming from Istria, Capua, Nola, Pozzuoli, Cyprus, and the Grecian islands.

Lactation. See **Breast.**

Lacteals, the lymphatic vessels which convey chyle collected from the mucous membrane of the small intestine to the thoracic duct.

Lactic Acid, α -hydroxypropionic acid $\text{CH}_3\text{CHOH COOH}$, is a mixture of two stereo-isomeric monobasic acids that differ principally in their action on polarized light, and can be separated by the crystallization of their cinchonine salts or the action of moulds. It is produced by the action of the lactic bacillus in the fermentation of sugars and similar bodies, and is thus formed on the souring of milk. It also occurs in gastric juice and in the residue left on distilling fermented liquors. Lactic acid, particularly its antimony salt, is used in dyeing and in calico-printing.

Lactometer (called also **Galactometer**) is a simple form of variable immersion hydrometer, graduated to give a rough indication as to the richness and purity of milk. See **HYDROMETER**.

Lactose. See **Milk Sugar.**

Lactuca is a genus of plants belonging to the order *Compositæ*. About 60 species are known. They are mostly natives of temperate regions.

Ladákh, the E. prov. of Kashmir, is bounded on the n. by the Karakoram Mts., and on the e. by Tibet. Gold, copper, iron, salt, borax, and sulphur are found in the province. Ladákh is a wild, mountainous province, inhabited by a race distinctly Tibetan. Originally a part of Tibet, the province was afterward independent until 1830, when it was annexed to Kashmir; p. 30,000.

Ladas, the name of two famous ancient Greek athletes. One a native of Laconia, won the long race at Olympia, but was afterward taken ill, and expired on his way home, about 5 m. from Sparta. The other was of Ægium in Achaia and won the short race at Olympia in 280 B.C. Pausanias is our authority for these athletes, and the Roman poets Catullus, Juvenal, and Martial mention a Ladas as proverbial for his speed.

Lading. See **Bill of Lading.**

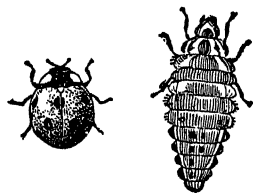
Ladoga, Lake, largest lake in Europe, covering an area of more than 6,900 sq. m. The s.w. corner of the lake is 23 m. from the Gulf of Finland, the shores and water belonging partly to the government of Soviet Russia and partly to the province of Viborg in Finland. The water is rich in fish. The chief ports are Kexholm, Sordobol or Sordavala, and Chertova Lakhtha. Navigation is open

from May to November, but the middle of the lake sometimes remains unfrozen the whole year round.

Ladon, in Greek legend, the dragon with a hundred heads which guarded, by Juno's orders, the apples in the gardens of the Hesperides. He is said to have been the offspring of Typhon and Echidna, and never slept.

Ladrones, or **Marianne Islands**, in the Pacific Ocean, to the north of the Caroline Islands, between 13° and 21° n. and 144° and 146° e., consists of 10 volcanic islands; total area is about 420 sq. m.; p. 13,500, of which 11,760 belong to Guam. The climate is temperate, and the soil fertile. The chief products are maize, cocoanut, coffee, cocoa, sugar, cotton, and tobacco, while the principal export is copra. The islands were first discovered by Magellan in 1521; in 1688 the Spaniards obtained possession of the islands. Guam was occupied by the United States during the Spanish-American War, and by the treaty of 1898 was retained by the United States. It is used as a naval station. All the islands except Guam were purchased by Germany from Spain in 1899.

They became a Japanese mandate when Germany was stripped of her colonies at the end of the World War.



Ladybird and Larva.

Ladybirds, or **Ladybugs**, are beetles of the family *Coccinellidæ*, and are of great economic importance because they feed entirely on aphids, scale insects, mites, and similar destructive forms. They are highly colored, usually with conspicuous spottings, and exude, when attacked, a fluid of unpleasant smell and taste.

Lady Day, or the Feast of the Annunciation, the 25th day of March, is quarter day in England and Ireland.

Lady Fern, popular name of the fern *Asplenium filix-femina*. It is variable in size and detail, of very graceful habit, and of thin, almost transparent texture, with conspicuous venation. Its color is a most delicate green. The lady fern and its varieties are easily cultivated in any damp, shady spot. See **FERN**.

Lady's Mantle is a popular name given to the plants belonging to the genus *Alchemilla*, a subdivision of the Rosaceæ order. They have no petals, the sepals are usually borne in two rows—four in each—and there are four stamens.



Lady Fern.
1, Pinnule.

Ladysmith, the third largest town of Natal, United South Africa, on the Klip River; p. 6,000.

Lady's Slipper, a popular name given to orchids belonging to the genera *Cypripedium* and *Selenipedium*. In the United States, the first of the species to bloom are the pink, furry moccasin flower (*C. acaule*), found in sunny, dry woodlands, and the yellow lady's slipper (*C. pubescens*), growing in swampy thickets. The handsomest, however, is the tall-growing, thickly leaved, showy lady's slipper of sphagnum bogs, which bears two or three large blossoms—pure white with a splash of purple at the lip.

Lady's Smock, or **Cuckoo-flower**, is a popular name given to *Cardamine pratensis*, a common meadow plant bearing pretty white or pale lilac, cruciferous flowers in May.

Lælia, a genus of tropical American orchids, allied to the genus *Cattleya*.

Laemmle, Carl (1867-1939), moving picture producer, born in Laupheim, Germany, came to the U. S. in 1884. Starting as clerk, he was manager of a store until 1906, when he opened a moving picture theater in Chicago. He founded Laemmle Film Service, 1906, and became Pres. Universal Pictures.

Laertes, in ancient Greek legend, king of Ithaca, was the son of Acrisius, husband of Anticlea, and the father of Odysseus. In his youth he took part in the Calydonian hunt and the Argonautic expedition. See Homer's *Odyssey*.

Læstrygonæ, in ancient Greek legend, a race of savages and cannibals whom Odysseus encountered in his wanderings.

Lætare Sunday, known also as **Mid-Lent**, the fourth Sunday in Lent; so-called from the first words, 'Lætare Jerusalem,' of the introit for that day.

La Farge, John (1835-1910), American painter, was born in New York City. He became a pupil of William M. Hunt. A figure of *St. John*, painted in 1861, shows his great advance in technical skill, some of his illustrations—such as *The Wolf Charmer* and *Bishop Hatto*—are the admiration and the despair of later illustrators. La Farge's first important commission was to decorate the interior of Trinity Church, Boston, in 1876. Meanwhile, La Farge had become interested in stained-glass work. Trinity Church, Boston, contains a number of his windows; while his famous *Battle Window*, comprising every variety of glass, and even precious stones, is in Memorial Hall, Cambridge, Mass. His last stained-glass work, the result of 22 years' experimenting, is the *Peacock Window* in the Worcester Museum. During the 30 years he devoted to stained glass he also painted many decorative pieces for public and private edifices—notably the frescoes



Marquis de Lafayette.
(From an engraving.)

in St. Thomas's Church, New York (1877), since destroyed by fire; the altar-piece of the Church of the Incarnation, New York; the *Arrival of the Magi*, in the Church of the Incarnation, New York, and the lunettes for the State capitol at St. Paul (1905). La Farge visited Japan in 1880, and the South

Seas in 1890-1, and brought back many sketches of these places. He was a member of the National Academy; also a founder of the Society of American Artists, and its president for many years. For his stained-glass exhibit at Paris, in 1889, he was awarded the Legion of Honor.

Lafayette, city, Indiana. It is the seat of Purdue University. Nearby are the famous Tippecanoe battleground and Fort Oniatan-on, built by the French in 1720. Lafayette is a market for fine horses, beef cattle, hogs, and sheep, and has packing houses. Soap, machinery, agricultural implements and lumber are manufactured; p. 28,798.

Lafayette, Marie Jean Paul Roch Yves Gilbert Motier, Marquis de (1757-1834), French soldier and statesman, was born in the castle of Chavagnac, in Auvergne. He married and entered the army in 1774, and in 1777 went to America with eleven companions, including Baron De Kalb, to assist the colonists in the War of Independence. With the exception of a year in France (1779-80), he served continuously until the close of the war, and evinced great bravery and ability as an officer. Despite his youth, he was one of Washington's most efficient subordinates, while as commander of the forces in Virginia (1781), he particularly demonstrated his skill as a strategist. Cornwallis retreated, pursued by Lafayette, to Richmond and finally to Yorktown. Lafayette twice revisited America (1784 and 1824-5), and was received with demonstrations of honor and gratitude. On his second visit, Congress conferred upon him a grant of \$200,000 and a township of 24,000 acres. He became a member of the French Assembly of Notables in 1787, and was prominent in the calling of the States-General. After the fall of the Bastille (July 14), Lafayette became commander-in-chief of the National Guard. He was a republican, therefore distrusted by the royalists; a friend of order and the constitution, therefore hated by the radicals. On the outbreak of the war with Austria in 1792, however, he was placed in command of an army on the frontier. After the overthrow of the monarchy (Aug. 10, 1792), in endeavoring to escape across the frontier he was captured by the Austrians. His release was obtained by Napoleon. His democratic principles led him to vote against Napoleon for life consul and for emperor, and to withdraw from public life during the latter's supremacy. In the revolution of 1830, he was the acknowledged leader, and

again commanded the National Guard. He was a member of the Assembly until his death, four years later.

Lafayette College, an institution for higher education, in Easton, Pa., was chartered in 1826, opened in 1832, and brought under Presbyterian control in 1850.

Lafayette Fish (*Leiostomus xanthurus*), also known as 'spot,' or 'goody,' is a well-flavored 'panfish,' abounding from Cape Cod to Texas. It is of a bluish-silver hue, with about fifteen wavy transverse bands.

Lafayette, Mount, In New Hampshire, the loftiest peak of the Franconia Mountains. Altitude, 5,269 ft.

Laffan, William M. (1848-1909), American editor, was born in Dublin, Ireland, joined the staff of the New York *Sun* in 1877, and from 1881 to 1884 was art editor for Harper and Brothers. In 1884 he became the publisher of the New York *Sun*, and in 1887 started the *Evening Sun*. He was an art connoisseur, and an authority on porcelains and antiques.

Lafitte, Jacques (1767-1844), French politician and banker, financed the second revolution, and became prime minister under Louis Philippe (1830-1).

Lafitte, Jean (c. 1780-1826), French pirate and smuggler, went to New Orleans about 1809, with his brother Pierre, and with him assumed the leadership of a band of smugglers. Pierre was finally captured, and while he was in captivity Captain Lockyer, of the British navy, offered Jean a captain's commission, \$30,000, and pardon for their past careers if he and his followers would join the British expedition against New Orleans. While pretending to treat with Lockyer, Lafitte informed the Americans of the British plans, but the Louisiana authorities suspected a plot by Lafitte, and an expedition sent against them at Barataria captured many of the company. Jean and Pierre escaped. With a number of their followers they later served effectively under General Jackson. In 1815 President Madison issued a proclamation, the terms of which extended pardon to the Lafittes and their followers.

La Follette, Robert Marion (1855-1925), American lawyer and legislator, was born in Primrose, Wis., and was educated at the University of Wisconsin. He was active in formulating the McKinley Bill. Afterward he became the organizer and head of the younger element of the Republican Party in Wisconsin, called the 'Half-Breeds,' who opposed the machine element. He was elected

governor in 1900, and was re-elected in 1902 and 1904, and in 1905 became U. S. Senator from Wisconsin, being subsequently re-elected for three terms (1911-29). La Follette was a conspicuous political figure, chiefly through his advocacy of an effective tax on corporations, the enactment of a suitable primary law, the direct election of senators, and other progressive legislation. He opposed America's entry into the Great War and bitterly criticized the terms of the Peace Treaty and the League of Nations. In 1924, having broken away from the Republican Party, which he felt had ceased adequately to represent the interests of agriculture and labor, he became the U. S. presidential candidate of the Conference for Progressive Political Action.

LaFollette, Robert M., Jr. (1895-), American public official, son of the above whom he succeeded in the Senatorship. He soon established himself as the keeper of the "LaFollette tradition" in U. S. politics by espousing those Progressive-Liberal causes to which his father had devoted his career. His brother, Philip Fox LaFollette, was elected Governor of their native Wisconsin. The young Senator supported President Roosevelt's New Deal and (1935) advocated a constitutional amendment to provide for a referendum on any future war issue but voted for war against Ger., It., and Jap., 1941.

La Fontaine, Jean de (1621-95), French poet and fabulist, was born in Château-Thierry, Champagne. The first book of his *Contes* (Tales)—1664—was warmly received, and secured for him the favor of Molière, Racine, and Boileau, with whom he formed the famous quartette of the 'Rue du Vieux Colombier,' the self-appointed dictators of literary taste. In 1672 La Fontaine was invited to make his home in the household of Madame de la Sablière, one of the leaders of the most brilliant and intellectual coteries in the capital; there he resided till her death, in 1692. Meantime he augmented his fame by the publication of the second book of his *Contes* and of the first six books of his inimitable *Fables* (1668), the final portion being issued in 1678. His *Fables* have been translated into almost every European language. Consult Racine's *Memoires*; Collin's *La Fontaine and other French Fabulists*.

Lafuente, Modesto (1806-66), Spanish satirist, journalist, poet, and historian, was born in Ravanal de los Caballeros.

Lagarde, Paul Anthon de (1827-91), German orientalist, was born in Berlin. A

list of his works, remarkable not only for their number and variety, but also for their accuracy and erudition, is given in Lichtenberger's *History of German Theology in the Nineteenth Century* (trans. 1889), and by Gottheil in the *Proceedings of the American Oriental Society* (1892). His library is now the property of New York University.

Lagenaria, a genus of plants belonging to the order Cucurbitaceæ. There is probably only one species, *L. vulgaris*, the calabash or bottle gourd.

Lagerlof, Selma Ottilliana Louisa (1858-1940), distinguished Swedish writer, was born in Marbacka Manor, Sunne, Vermland. While teaching in the Girls' Grammar School in Landskrona, she produced her first book, *The Story of Gosta Berling* (1894), which was widely translated, and at once established its author's reputation. Commissioned by the Swedish school authorities to prepare a school reader which would serve to keep alive the folk lore and historic tradition of Sweden, she wrote *The Wonderful Adventures of Nils* (1906) and *The Further Adventures of Nils* (1907), both of which achieved a remarkable degree of popularity. She was made a doctor of literature by Upsala University in 1907, was awarded the Nobel prize for literature in 1909, and was elected in 1914 to the Swedish Academy, the first woman to receive this distinction. Most of her books have been translated into English, chiefly by Velma Swanston Howard. They include, besides those already mentioned, *From a Swedish Homestead* (1899); *The Girl from the Marsh Croft* (1908); *Liljicrona's Home* (1911); *The Legend of the Sacred Image* (1913); *The Emperor of Portugal* (1914); *Men and Trolls* (1916); *The Queens of Kungahalla* (1917); *The Outcast* (1920); *Marbacka* (1922); *Gösta Berling's Saga* (1933); *Christine Lavransdatter* (1934).

Lagerstroemia, a genus of tropical and sub-tropical trees and shrubs belonging to the order Lythraceæ. The best known varieties are *L. indica*, the crape myrtle, a native of China, largely cultivated in the Southern States of America, where it grows as a hardy shrub.

Lagoon Islands. See *Ellice*.

Lagos, a territory in West Africa, forming, since 1914, a part of the Colony and Protectorate of Nigeria. The inhabitants are chiefly engaged in trading and agriculture. The climate is exceedingly unhealthy, especially for Europeans. In 1861 the port

and territory of Lagos were ceded to Great Britain by the local king and from that time until 1866 it was administered as a crown colony. In 1866 it was associated with Sierra Leone, in 1874 was connected with the Gold Coast, and in 1886 again became a separate crown colony. In 1906 it was united with Southern Nigeria in the Protectorate of Southern Nigeria, which in 1914 became a part of the Colony and Protectorate of Nigeria.

Lagos, town, Nigeria, West Africa, in the territory of Lagos, is situated on an island which is connected by bridges with the mainland. It is one of the most important towns in West Africa. The town is the seat of the central government; p. about 73,000.

Lagrange, Joseph Louis, Count (1736-1813), French mathematician, was born in Turin. In 1776 he was appointed by Frederick the Great to succeed Euler as director of the Berlin Academy, a post which he held for twenty years. In 1786 he removed to Paris and in 1797, on the establishment of the Ecole Polytechnique, was made professor there. Before going to Berlin he had completed his *Calcul des variations* (1762), and after his return to Paris he published his great work, the *Mécanique analytique* (1788). Most of the great developments of last century find their source in his work. An excellent edition of Lagrange's works, *Œuvres Complètes de Lagrange*, edited by Serret and Darboux, was published in 14 vols. (1867-92).

La Grippe. See *Influenza*.



F. H. La Guardia
Mayor of New York City.

La Guardia, Fiorello H. (1882-), lawyer and mayor, was born in New York City. At twenty he was appointed to serve with the America Consulate in Austria Hun-

gary and stationed at Trieste and Budapest (1901-1904) and at Fiume (1904-1906). Returning to New York City he studied law and was from 1915 to 1917 a Deputy Attorney General of New York State. He served in Congress in 1915-1917 and again in 1922-1933. In 1919, though a Republican, he was elected President of the Board of Aldermen to succeed Alfred E. Smith, who became Governor. Twice a candidate for Mayor of New York City, in 1929 and 1933, he was elected in the latter year as the candidate of the Republican and the City Fusion parties, on a ticket pledging reform. In Congress he was a steadfast opponent of the Republican Old Guard and a frequent critic of the policies of Herbert Hoover. During the World War he was an Air Corps officer. Re-elected Mayor, 1937, 1941; directed civilian defense in 1941.

La Guayra, chief port of Venezuela, is situated on a narrow strip of land between the sea and the mountains, 8 m. from Caracas. In 1903 the fort was bombarded by the British and German fleets to enforce the settlement of claims against the government of Venezuela; p. about 12,000.

Laguna, province, Luzon, Philippine Islands, with an area, including four small dependent islands, of 752 sq. m. It is one of the most fertile of the provinces, producing sugar-cane, rice, corn, cotton, tobacco, indigo, cocoanuts, betel nuts, fruits, and vegetables. The capital is Santa Cruz, at the mouth of Santa Cruz River; p. 197,000.

La Habana, province, Cuba, in the western part, stretching from the Gulf of Mexico to the Caribbean Sea and lying between Pinar del Rio and Matanzas; area 3,170 sq. m. It is the most populous and important of the provinces. The capital is Havana; p. 783,014.

La Hague. See *Hague*.

Lahore. Capital of district of same name, on l. bk. of the Ravi. It is the railway center of the province. Its carpets and silk and woolen goods are noted. Lahore's era of splendor was co-incidental with the reign of Akbar (1556-1605). The Sikhs took it in 1758, and later Ranjit Singh became master of the Punjab. A period of anarchy followed his death in 1839. In 1846 the British Council of Regency was established, and in 1849 the young maharajah transferred the government of the Punjab to the East India Company. Lahore thenceforth became the capital of a British province; p. including suburbs 281,781.

Laidlaw, William (1780-1845), friend and amanuensis of Sir Walter Scott, born at

Blackhouse, Selkirkshire, and became acquainted with Hogg and Scott, the latter of whom he supplied with materials for the *Minstrelsy of the Scottish Border*. Laidlaw was himself a poet, as his tender *Lucy's Flit-in'* attests. See Lockhart's *Life of Scott*.

Laissez Faire, an economic epigram which has become the designation of the policy of unrestricted competition and no state interference. The epigram was adopted by Adam Smith, and Ricardo and the classical economists elevated it almost to the rank of a principle. The maxim is not absolute, and weightier considerations may be, and have been, invoked to set it aside—e.g. in sanitary and factory legislation.

Lake. A lake is a basin of water surrounded by land. The origin of lakes may usually be ascribed to interference with drainage. To volcanic action are due crater lakes, such as Crater Lake, Oregon. Landslips have dammed valleys and formed lake basins. Sinks or shallow holes in porous limestone may be choked and form lakelets. Rivers form lakes by the gradual dissolution of soluble limestone through lateral erosion, and underground lakes are due to similar decomposition of the rock. Most of the lakes in the northern part of the United States and Canada have been formed by glacial action. Lakes may be divided into fresh-water, brackish, and salt lakes. The salinity of the water is greatest in lakes with no outlet in rainless regions. The Dead Sea and Great Salt Lake are among the saltiest lakes, and are under such conditions. Every transition from them to the pure fresh-water lakes can be found.

Lake District of England comprises adjacent parts of Cumberland, Westmorland, and Lancashire. Windemere, about 10½ m. long by less than 1 m. in breadth, is situated in the s.e., and connected with Rydal Water, Grasmere, Elther Water, and Esthwaite. More to the w. is Coniston Water, dominated by the peak called Coniston Old Man. In the n.e. is Ullswater, with Hawes Water to the s.e.; and to the w., beyond Helvellyn, Thirlmere, now the head reservoir of the Manchester water supply. Northwest of Thirlmere are Derwentwater and Bassenthwaite, and n.e. the mountain group in which rise Skiddaw and Scafell. Buttermere, Crummock Water, and Loweswater lie s. w.; Ennerdale still further s.w., and Wast Water, s.e. of the latter. Sty Head Pass, n.e. of Wast Water, is famed as the wettest place in England. There are several waterfalls.

See Rawnsley's *Life and Nature at the English Lakes* (1899); Bradley's *Highways and Byways in the Lake District* (1901); and Cooper and Palmer's *English Lakes* (1905).

Lake Dwellings. See **Pile Dwellings**.

Lake Forest, city, Lake co., Ill., on a high bluff on the shore of Lake Michigan. It was incorporated in 1857, became an educational center, and is one of the most beautiful residential suburbs in the Middle West. Lake Forest University is situated here, also Lake Forest Academy and a school for girls; p. 6,885.

Lake Forest University. A coeducational institution under Presbyterian control, at Lake Forest, Illinois, established in 1856 as Lind University, receiving its present name in 1865. It consists of the liberal arts college, established in 1876, and two preparatory schools, one for boys, opened in 1858, and Ferry Hall for girls opened in 1869. For recent statistics, see table of American Colleges under **UNIVERSITY**.

Lake of the Thousand Islands. See **St. Lawrence River**.

Lake of the Woods, large sheet of water on the frontier between Minnesota and Ontario. It derives its name from the wooded islands with which it is studded and the surrounding tree-clad hills. Length, 65 m.; circumference, 300 m.

Lake Placid, village, New York, Essex co., on Lake Placid and Mirror Lake. In the heart of the Adirondacks at an elevation of 2,000 feet, it is one of the foremost all-year resorts in the country and a center for international skating, ski-jumping and other winter sports; p. 3,136.

Lakes, insoluble pigments obtained by precipitating solutions of organic coloring substances with metallic salts. Lakes are chiefly used in making paints, and in dyeing, while those of vegetable origin are used to some extent for coloring pastry and candies.

Lake School of Poets, Lakers, or Lakists, titles first applied in derision by the *Edinburgh Review* to the poets Wordsworth and Coleridge, who lived in the Lake district of England. Southey belongs to the Lake School only by residence and friendship, though he is usually considered a member. Shelley, Keats, and Byron were its disciples.

Lake State, popular name of Michigan.

Lakh, from Sanskrit *laksha*, 'one hundred thousand.' The word is employed in India to signify 100,000 rupees.

Lakshmi, or **Sri**, in Hindu mythology, the

consort of Vishnu, and the goddess of fortune and beauty; generally represented in gold, seated upon a lotus. She is mother of Kâma, the Hindu God of love.

Lalande, Joseph Jérôme le Français de (1732-1807), French astronomer, was born in Bourg. His observations of 50,000 stars, given in *Histoire céleste française* (1801), proved invaluable, and he wrote several successful popular works. The Lalande Prize was instituted by him in 1802, to reward the chief astronomical performance of each year.

Lalemant, Gabriel (1610-49), French Jesuit missionary, nephew of Jérôme Lalemant, was active in the religious history of early Canada. He went to that country in 1646; took charge of the Huron mission (1648); was captured by the Indians in the village of St. Louis, and put to death with torture.

Lalemant, Jérôme (1593-1673), French Jesuit missionary, taught in Jesuit schools in France, and in 1638 was sent to Canada. He worked among the Hurons; was superior of the missions in New France in 1645-50, and in 1647 became vicar-general of the French possessions. To this office he was reappointed in 1659.

Lalita-Vistara, one of the nine principal religious works of the Buddhists, containing the life and doctrines of the Buddha S'âkyamuni. An English translation has been made from the Sanskrit text, and a French one from the Tibetan.

Lama. See **Llama**.

Lamaism, a form of Buddhism professed by the Tartar aces of Tibet, Mongolia, Manchuria, and Northern Nepal. It was introduced into Tibet in the 7th century but made little headway until the following century (about 750 A.D.). Buddha is accepted as an incarnation of the divine essence and this acceptance has resulted in the establishment in Tibet of a hierarchy headed by the Dalai Lama ('sea of wisdom'), whose judgment is supreme. The pontiff is established at Lhasa, the capital of Tibet and until recently a forbidden city to the European. A Grand Lama, it is held, does not die, but from time to time, he lays aside his human envelope and is rejuvenated. New 'living Buddhas' are always sought for and discovered in Tibet, the choice usually falling on a boy between four and five years of age, amenable to the training required. Encouragement of celibacy led to the foundation of the lamaseries throughout the countries which acknowledge the creed. These monasteries, many largely en-

dowed and some capable of housing 30,000 individuals, are the churches, colleges, schools, and hospitals of the people, the resort of pilgrims, and the repositories of Lamaesque arts, science, and literature. For many years the Dalai Lama was the temporal as well as spiritual head in Tibet; but in 1910 Chinese troops occupied Lhasa, and the Dalai Lama fled to India. See **BUDDHISM**; **TIBET**; **LHASA**. Consult Waddell's *Buddhism of Tibet*.

Lamar, Lucius Quintus Cincinnatus, 2d (1826-93), American statesman, was born in Putnam co., Ga. He was prominent in the Secession movement, and entered the Confederate army as lieutenant-colonel, serving with the Army of Northern Virginia and taking part in many engagements. He was elected in 1872 to Congress, was re-elected in 1874, and led the newly reorganized Democratic Party in the House until 1877, when he entered the Senate. He was Secretary of the Interior under President Cleveland from 1885 to 1888, when he was made an associate justice of the U. S. Supreme Court.

Lamarck, Jean Baptiste Pierre Antoine de Monnet, Chevalier de (1744-1829), a French naturalist and evolutionist, and the ablest precursor of Darwin, was born at Barentin. While working in a banker's office in Paris he wrote his *Flore Française* (1778). In 1788 he became custodian of the herbarium of the Jardin du Roi, and later was associated with this garden as a professor of zoology, a post he held for 25 years. In 1809 he published his famous *Philosophie Zoologique*, and between 1815 and 1822 he published the seven volumes of his *Histoire des Animaux sans Vertèbres*. Lamarck was also a voluminous writer on other scientific subjects. See Haeckel's *Die Naturanschauung von Darwin, Gothe, und Lamarck* (1882); Perrier's *Lamarck et le Transformisme Actuel* (1893), and Packard's *Lamarck the Founder of Evolution*, etc. (1901).

Lamartine, Alphonse Marie Louis de Prat de (1790-1869), French poet, was born at Mâcon. In his 30th year Lamartine published his first volume of poetry, *Premières Méditations Poétiques* (1820), which achieved an immediate success. In 1823 and 1825 Lamartine published three more volumes, *Nouvelles Méditations Poétiques* (1823), *La Mort de Socrate*, and *Le Dernier Chant de Childe-Harold* (1825), the last of which proclaims clearly enough whence Lamartine drew his first inspiration in poetry. In 1829 he was elected a member of the Academy. In 1830

he published his *Harmonies Poétiques et Religieuses* in 1834 (in prose) *Voyage en Orient* (his experience of a yachting tour), in 1836 *Jocelyn* (the history of a country parson), in 1838 *La Chute d'un Ange*, and in 1839 *Recueils Poétiques*—all poems. It was about this time that Lamartine threw himself into politics upon the Moderate Liberal side. From 1835 to 1837 he was *député* for Bergues in the Nord, and from 1837 to 1848 *député* for Mâcon. In politics he played a conspicuous part, but a less lasting one than in the field of literature. Under the empire Lamartine gradually sank into comparative poverty, and was obliged to write rapidly and superficially a great number of works in prose. With a diminished luster, Lamartine remained still one of the personage of French literature till his death. His *Œuvres Complètes* were published by Didot in 14 vols. (1849-50). See Sainte-Beuve's *Portraits Contemporains*, I., and *Causeries du Lundi*, I., IV.; Ronchaud's *La Politique de Lamartine* (1878); *Alexandre's Souvenirs sur Lamartine* (1884); Lady Dornville's *Life of Lamartine* (1888); and Deschanel's *Lamartine* (1893).

Lamb, Charles (1775-1834), English essayist, was born in the Temple, London. After some education at a little school off Fetter Lane, he was sent to Christ's Hospital in 1782, among the other new boys at the same time being Samuel Taylor Coleridge, with whom a friendship then began which ceased only with Coleridge's death in 1834. Lamb remained at Christ's Hospital until 1789, soon afterwards obtaining a nomination to a small clerkship in the South Sea House, where his elder brother John held office—a post which led 30 years later to the first of the *Essays of Elia*, entitled, 'Recollections of the South Sea House.' Leaving the South Sea House after only a brief sojourn there, Charles Lamb on April 5, 1792, entered the East India House, and remained in its service until 1825. The same year the Lamb family moved to 7 Little Queen Street, and there, on Sept. 22, 1796, an incident occurred which changed the whole character of Charles Lamb's life. His sister Mary, who had long been strange in manner, suddenly lost her reason and stabbed her mother fatally. Charles on undertaking to be responsible for her, was allowed to arrange for private restraint. From that day until his death the welfare of his sister was his first consideration. Charles Lamb's earliest literary efforts were in verse. In 1796 he contributed four sonnets to Coleridge's

Poems on Various Subjects. In 1797 he contributed a whole section to the second edition of that work; and in 1798 he joined with Charles Lloyd, a young Quaker metaphysician, later Coleridge's pupil, in the composition of a volume called *Blank Verse*, in which 'The Old Familiar Faces' and the most personal and feeling of all his poetical work is to be found. In the same year (1798) was published his first prose work, *Rosamund Gray*. Between 1800 and 1805 Lamb contributed paragraphs and epigrams to newspapers, but wrote nothing remarkable. Between 1805 and 1810, however, came a period of great productivity. Besides his India House work, he found time to write an unsuccessful farce, *Mr. H.*; to begin his children's books for Mrs. William Godwin with *The King and Queen of Hearts* (1805), followed by *Tales from Shakespeare* (with Mary Lamb, 1807); to select his *Specimens of English Dramatic Poets who lived about the Time of Shakespeare* (1808); and to write a number of humorous letters and critical essays for Leigh Hunt's magazine, the *Reflector* (1810-11). Then followed, however, a curiously empty 10 years. In 1818 he collected his *Works*, which contained, however, very little that was new. But in 1820 came a change. In that year was founded the *London Magazine*. John Scott, the editor, acting, it is said, upon the suggestion of Hazlitt, asked Lamb to contribute. Lamb accepted the invitation, the essay on the South Sea House, signed 'Elia' (the name of an old South Sea House clerk in Lamb's day), appeared in the August number, and Lamb's ripest and best known work had begun—in his 46th year. Almost everything by which he is best known was written between 1820 and 1823. For five years Lamb continued with the *London Magazine*. He then moved to the *New Monthly Magazine* for a while, and contributed to it the *Popular Fallacies*. He also gave William Hone, for his *Table Book* (1827), the fruit of his researches for notable passages in the Garrick collection of old plays in the British Museum; and in 1830 he collected his later poems to form a book, *Album Verses*. A year later he issued a burlesque poem, *Satan in Search of a Wife*, and in 1833 a second collection of *Elia* essays. Lamb remains in our minds first and foremost as an essayist. His *Elia* (1823) and the *Last Essays of Elia* (1833) are two volumes which stand quite alone in English literature. Lamb was pensioned off by the East India directors in 1825. He was then living at Is-

lington, in a cottage in Colebrooke Row that still stands, and, internally, is practically as he left it. Later he moved to Enfield, and thence to Edmonton, where he died. Crabb Robinson's *Diary* gives us many glimpses of this rare figure, but it is upon Talfourd's *Memorials of Charles Lamb* (1837) and *Final Memorials of Charles Lamb* (1848) that all later biographies have been based. Other valuable character sketches are found in Hazlitt's essays, Wordsworth's poem on Lamb's death, Fitzgerald's *Charles Lamb*



Charles Lamb.

(1866), De Quincey's *London Recollections*, Barry Cornwall's *Memoir* (1866), and E. V. Lucas's *Life of Charles Lamb* (1905). The best editions of Lamb's writings are *Life and Works*, ed. by Canon Ainger—*édition de luxe*—(12 vols. 1899-1900); *Works of Charles and Mary Lamb*, ed. by F. V. Lucas (7 vols. 1903).

Lamb, Mary Anne (1764-1847), writer for children, and sister of Charles Lamb, was born in the Temple, London. Like her brother, her talents developed slowly and she was 42 years old before she began the *Tales from Shakespeare*, her first book. After 1800 she lived with her brother, and shared his intellectual life until his death in 1834—a companionship broken only by almost annual attacks of insanity which endured weeks at a time. *Mrs. Leicester's School*, a little work of rare and delicate charm, contains Mary Lamb's prose masterpiece, 'The Young Mahometan.' The same year saw the publica-

tion of *Poetry for Children*, two tiny volumes of simple verses drawn from every day incidents. Consult Hazlitt's *Mary and Charles Lamb*, and *The Lambs: Their Lives, Their Friends* (1897).

Lamballe, Marie Thérèse Louise, Princesse de (1749-92), a famous beauty, the friend of Marie Antoinette, was born in Turin. She became head of the queen's household and at the time of the Revolution fled to England but voluntarily returned to share her mistress's imprisonment, and, refusing to renounce her allegiance to the queen, was killed by the Paris mob.

Lambayeque, department, Peru, in the northwestern part; area, 4,614 sq. m. The chief products are sugar, rice, tobacco, and cotton; p. 140,000. Its capital is Lambayeque; p. 8,000.

Lambert, Alexander (1862-1930), Polish-American musician, was born in Warsaw. After successful concert work in Germany, he went to New York, where he was appointed director of the New York College of Music, a position he held until 1905 when he resigned to devote himself to teaching. Some of his best known compositions are *Etude-Bourrée*, *Valse Impromptu*, and his *Ave Maria* for soprano voices.

Lambessa, or **Lambese**, town, Algeria. It is supposed to occupy the site of Lambesis, the ancient military capital of Numidia. It is particularly noted for its Roman ruins, which consist of ancient walls, baths, a triumphal arch to Severus, temples, and remains of a huge Roman camp.; p. about 2,000.

Lambeth, metropolitan borough of London, on the Thames, opposite Westminster. Its most interesting feature is Lambeth Palace, the residence of the archbishops of Canterbury, founded in the 12th century; but the present buildings belong to the 13th century and later periods. The great hall, containing the valuable library, chapel, and crypt, is of special interest. Consult Cave-Browne's *Lambeth Palace and its Associations*; p. 296, 162.

Lambeth Conferences, periodical gatherings of all bishops of the Anglican communion, held in Lambeth Palace. These conferences have no legislative authority but exercise a far-reaching influence. The famous 'Lambeth Quadrilateral' was formulated in 1888 as a basis for home reunion—i.e., the Holy Scriptures, the Apostles and Nicene creeds, the two sacraments ordained by Christ himself, and the historic episcopate. The question specially stressed at the sixth con-

ference was that of the unity of all Christendom; and it also declared itself without reserve as in favor of the League of Nations. The 7th conference was held in 1930 with 308 bishops in attendance, including many from the United States.

Lamellibranchiata, a group-name for bivalve molluscs on account of the structure of the gills, which form flat, membranous plates or lamellæ. See BIVALVES, and MOLLUSCA.

Lamellicornia, or **Lamellicorn Beetles**, a tribe of beetles in which the antennæ have their terminal joints leaflike, and capable of separation and apposition—a characteristic by which the insects are readily recognized. For examples and further particulars, see ROSE-CHAFER, STAG-BEETLE.

Lamennais, Felicite Robert de (1782-1854), French abbé and philosopher, member of an old family of the *bourgeoisie*, was born in St. Malo. After the revolution of 1830 he assisted in founding *L'Avenir*, with its motto, *Dieu et Liberté*; and when it was condemned by ecclesiastical authority, he went to Rome with its co-founder, Montalembert and Lacordaire, to plead the cause of liberty. In later years he belonged to the democratic party, and fiercely attacked the opinions of which he had been hitherto the foremost champion. Renan, who wrote in his *Essais de morale et de critique* (1859) a masterly paper about Lamennais, declares that his life might be summarized in the words, 'The same system of eloquent hatred applied to the most diverse objects.' His *Œuvres complètes* were published in 1836 and 1844, and were followed by his *Œuvres posthumes* (1855-8), his *Correspondance* and *Correspondance inédite* (1886). Consult Dowden's *Studies in Literature*; Sainte-Beuve's *Portraits contemporains*; Janet's *La Philosophie de Lamennais*; Mercier's *Lamennais*.

Lamentations, The Book of, a short poetical book of the Old Testament, called in Hebrew '*Ekkah* (i.e., 'How'), from its first word. It consists of five elegies expressive of the sufferings of the people of Jerusalem during and after the Chaldean siege (587 B.C.). In the English Bible, as in the Septuagint, it follows Jeremiah, in accordance with the tradition that it was written by that prophet; in the Hebrew canon it forms one of the five Megilloth, or 'Rolls.' Modern criticism has reversed the judgment of tradition, placing its date about half a century after the destruction of Jerusalem and considering it a compilation of many of Jeremiah's utterances. Consult Driver's *Introduction* (6th

ed.), and *Commentaires* by Ewald, Oettli, Reuss, Löhr, and others.

Lamia, L. Ælius (d. 33 A.D.), a friend of Horace, to whom Horace dedicated two of his odes. He was consul in 3 A.D., and prefect of the city in 32.

Lamia, in ancient Greek legend, a female phantom or ogress, said to have been a Libyan queen, whom Zeus loved. Hera, from jealousy, deprived her of her children; and Lamia, in revenge, seized other children, and murdered them. In later writers Lamiaë are represented as vampires who assumed attractive form. A poem by Keats has the legend for its subject matter.

Lamia, town, Greece, near the head of the Gulf of Lamia. It contains a mediæval fortress, a mosque, and remains of the ancient city from which the Lamian war took its name; p. 8,000.

Laminariaceæ, an order of brown seaweeds, some of whose genera grow to enormous size and sometimes form submarine forests. The propagative cells are always swarm-spores of similar form and size, produced in unilocular sporangia. Some of the species are important sources of iodine and of potash. See also KELP.

Lamination, the arrangement of rocks in thin layers or laminae. Shale deposits exhibit this structure very plainly, being frequently easily separable into the thin laminae in which they were originally deposited. The laminae indicate interruption in the supply of the materials, which may have been occasioned by successive tides, by frequent or periodical floods, or by the carrying medium having access to a supply of different material, passing, e.g., from mud to sand, and back again to mud.

Lamium, a genus of Labiatæ. The white dead nettle, or archangel, *L. album*, with square stem and white flowers with black stamens, and the purple-flowered dead nettle, *L. purpureum*, with two other species, have become naturalized in America.

Lammergeier, (*Gypæus barbatus*), a large and handsome bird of prey, formerly distributed throughout the mountainous regions of Southern Europe, and extending to the Himalayas and North China, but now practically extinct in Europe.

Lammermoors, or **Lammermuir Hills**, a broad range of hills in the southern part of Scotland, on the boundary between the shires of Berwick and Haddington. Its highest summits are about 1,800 ft.

La Moin, a river of Illinois, which enters

the Illinois River, 10 m. from Rushville. It is about 100 m. long.

Lamont, Robert Patterson (1867-), American public official, was born in Detroit, Mich. From 1912 to 1929 he was president of the American Steel Foundries Company. During the War he was connected with the Ordinance Department in Washington and received the D.S.O. from Congress. He is a director in many important industrial concerns, a trustee of the University of Chicago and of the Chicago Art Institute. He established the astronomical observatory of the University of Michigan in South Africa. In 1929 he became Secretary of Commerce in President Hoover's cabinet.

Lamont, Thomas William (1870-), American banker, born in Claverack, N. Y. He joined the firm of J. P. Morgan & Co., in 1911 and is director of many financial corporations. He was one of the chief financial advisers of the American delegation during the Peace Conference in Paris and took a prominent part in the later discussions on reparations in London and Paris.

La Motte, Antoine Houdar de, generally known as La Motte-Houdar (1672-1731), French poet and playwright, was born in Paris. His views of poetry were somewhat revolutionary and he was one of the earliest of the Moderns. He is the author of *Inès de Castro* (1723), a tragedy; *Le magnifique*, a comedy; and *L'Europe galante* (1697), a ballet, all of which acquired considerable contemporary fame; *Fables* (1719); *Odes* (1707). His *Œuvres* were published in 10 vols. (1754).

Lamotte, Jeanne de Luz de St. Remy de Valois, Comtesse de (1756-91), French adventuress who by playing upon the Cardinal de Rohan's infatuation for Marie Antoinette, obtained through him a diamond necklace worth 1,800,000 francs, with which her husband absconded. Rohan was disgraced, and Lamotte whipped and branded. She fled to England, where she published her *Mémoires* (1788; Eng. trans. 1788).

La Motte Fouqué. See **Fouqué**.

Lamoureux, Charles (1834-99), French violinist and conductor, was born in Bordeaux. He was appointed conductor of the Opéra in 1877 and in 1881 he instituted the famous *Concerts Lamoureux*, and was the leader of the Wagnerian movement in France.

Lampblack, a finely divided soot formed by the incomplete combustion of carbon compounds, such as heavy oils or pinewood. It consists chiefly of carbon with about 10

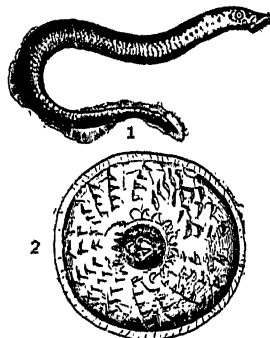
per cent. of complex hydrocarbons, and is used mainly in the preparation of printing ink.

Lampedusa, small island in the Mediterranean between Tunis and Malta, in possession of Girgenti, Italy, since 1843. It is fertile and produces fruit and grain; p. 1,200. June 11, 1943, it surrendered to the Allies.

Lampoon, a name applied to any malicious satire written purposely to ridicule or abuse its object, usually a person.

Lamprecht, Karl (1856-1915), German historian, was born in Jessen. *Deutsche Geschichte* (13 vols. 1891-1908), is his most important work, in which he exemplifies his contention that the science of history is social-psychological and not exclusively political.

Lamprey, an eel-like animal which, though often regarded as a fish, differs from a fish in the absence of paired fins and scales, in the rounded suctorial mouth without supporting jaws, in the presence of gill-pockets



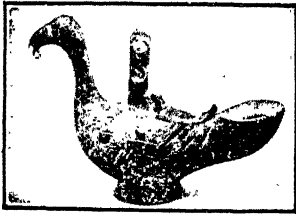
Lamprey.

1, Sea lamprey (*Petromyzon marinus*). 2, Enlarged view of mouth.

in place of the gills of fish, as well as in numerous internal peculiarities. In consequence, the lamprey and the related hag are placed in a distinct class known as cyclostomes, or round mouths. The great sea lamprey (*Petromyzon marinus*), sometimes 3 ft. long, is found on both coasts of the North Atlantic. Several smaller species inhabit the lakes and rivers of the United States. Consult *Royal Natural History*, Vol. 5.

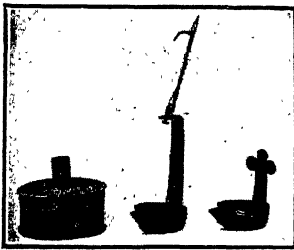
Lamprophyres, a group of igneous rocks which are usually found filling dikes. They are characterized by their dark color and the presence of porphyritic crystals of biotite, angite or hornblende.

Lamps, articles used to furnish artificial light by means of some inflammable material such as fats and oils or electricity. The origin of the first lamp is hidden in mystery



*Bronze Lamp from Asia Minor,
7-8th Century*

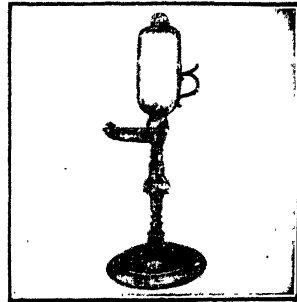
but it is probable that primitive man seeing the fat from his roasting meat set ablaze by his fire conceived the idea of a lamp. Next to implements of war, stone and clay lamps were among the first articles fashioned by man. The earliest specimens were made of clay, sun-dried or kiln-burned; later they were fashioned of rock, and still later of iron, bronze and other metals. Greek and Roman lamps were frequently made of alabaster and were often highly artistic in design. An ancient form of lamp was the rush light made



*American Betty Lamps and Tinder
Box, 17th Century*

of the stalks of flax and rushes pressed together and saturated with grease or tallow. In early Colonial days in the United States lamps were made of iron, similar in shape to the Greek and Assyrian ones. Copper, tin, brass and pewter were also used and somewhat later glass came into great favor. Among the varieties of lamps now in use the following are most important. *Wick Lamps*.—While formerly lamps of this type were almost invariably fed by oils of animal or vegetable origin, such oils have been largely supplanted by mineral oils, derived from petroleum. They yield a good light and are often

almost the only illuminant in country places. They are used with closely woven wicks that are either flat or tube-shaped. As kerosene oils require to be burned with a good supply of air in order to give as white a light as possible and prevent smoking, a draught is usually provided by a glass tunnel or chimney of more or less cylindrical shape, and is guided by a dome over the wick-holders so as to flow in a current parallel to and round the flame from its base. *Spray and Vapor Lamps*.—In this type of lamp, employed by con-



*German Clock Lamp of Pewter,
17th Century*

tractors for temporary nightwork out of doors, the crude oil used is held in a strong iron cylinder. Air is forced into the space above the oil by a hand pump, thus driving the oil up a pipe that extends from the bottom of the tank to the burner. Here it passes through tubes heated, when the burner is in action, by the flame itself, or when starting by burning some oily waste round them, so



*French Pewter Lamp, 19th
Century*

that it escapes from the jet partly as spray and partly as vapor, burns with a rough and roaring but brilliant flame. The lamps used by plumbers and painters are on a similar plan, but the fuel, either gasoline or benzine, is completely vaporized, and the jet of vapor

mixed with air, so that it burns with a non-luminous flame like that of a blow-pipe. Vapor lamps for indoor lighting may be divided into two classes—*viz.* those that owe their light to the finely divided carbon particles set free by the decomposition of the hydrocarbon in the flame, and those in which the flame is on the Bunsen principle, and consequently non-luminous, but which heats up a mantle of refractory oxides to incandescence. Examples of the former type are given in the benzine lamps. The most successful vapor lamps in which a mantle is used are those fed either with alcohol or light petroleum spirit. Similar lamps are constructed to be used with gasolene. The only lamps coming within the definition that consume what may be strictly called gas are those burning acetylene, as, although this gas is usually supplied from a central installation of greater or less size, it can also be prepared in a generator contained in a portable lamp. For lamps used in mines, flour mills, oil warehouses and such places where the atmosphere may become explosive from admixture with inflammable gas or vapors, see SAFETY LAMP.

Lighthouse lamps are of the circular wick type, usually with three or more concentric wicks. They burn paraffin or petroleum oil of high specific gravity and flash point which is pumped up to the wicks by a mechanism driven by a falling weight, and burns with a light of great intensity and fog-penetrating power.

Lamps, Electric. See Electric Lamps.

Lampsacus, now **Lapsaki**, important city of ancient Phrygia, Asia Minor, on the southern coast of the Hellespont. It was a place of flourishing trade and was famous for its vineyards. It was the seat of the worship of Priapus.

Lanaria, a genus of the order Hæmodoraceæ, containing only one species. *L. plumosa* is a South African herbaceous, perennial plant growing to about one foot in height, bearing white, feathery flowers, with a six-partite perianth.

Lanark, town, Scotland, county town of Lanarkshire, on the high ground half a mile above the right bank of the Clyde, and close to the famous falls. The district is rich in associations connected with William Wallace; p. 6,000.

New Lanark, $1\frac{1}{2}$ m. s.w. of Lanark, is the site of the cotton mill founded in 1785 by Dale and Arkwright, of which Robert Owen, the social reformer, was long manager.

Lanarkshire, inland county of Scotland;

area 879 sq. m. The northern part of the shire has shale, coal and ironstone mines and fire clay beds that make it the richest mineral field in Scotland. It is celebrated for its breed of working horses (Clydesdales). It is the most populous of the Scottish shires and the large deposits of coal and the nearness of the Clyde ports have made possible the enormous development of the cotton, flax, and woolen manufactures, and of the iron-working and kindred industries in and around Glasgow. Lanark is the county town. Besides prehistoric and Roman remains, Lanarkshire contains the castles of Bothwell, Douglas, and Craignethan (Scott's 'Tillietudlem'), the priories of Blantyre and Lesmahagow, and the battlefields of Langside, Drumclog, and Bothwell Brig; p. 1,539,442.

Lancashire, large maritime county in the west of England, lying chiefly between the Mersey and Morecambe Bay. The Manchester Ship Canal, opened 1894, enables ocean vessels to ascend to Manchester. The principal crops are oats, wheat, and potatoes; cattle and sheep are reared, and there are many dairy farms. The chief coal fields are in South Lancashire and Burnley, and iron exists in abundance, the two forming a flourishing industry. Lancashire is an important cotton manufacturing district and has also iron works, manufactures of chemicals, and plate and other glass, and shipyards. Lancashire was constituted a palatinate by Edward III. (1363), and for a long time it enjoyed almost sovereign privileges. Area 1,887 sq. m.; p. 5,039,097. Consult Croston's *Historic Sites*; Mortimer's *Industrial Lancashire*.

Lancaster, capital of Lancashire, England, on the Lune River. The chief points of interest are the castle, which still retains its ancient keep and is used as a jail, the 15th century church of St. Mary, and the Storey Art Gallery. There are manufactures of silk, cotton, pottery, and leather, and there is a good harbor; p. 43,396.

Lancaster, town, Massachusetts, in Worcester co. Lancaster was settled in 1643, and incorporated in 1653. It was twice raided and its inhabitants massacred by the Indians during the early Indian Wars. Luther Burbank was born here; p. 2,963.

Lancaster, city, Pennsylvania, county seat of Lancaster co., on the Conestoga River. It is the seat of the Theological Seminary of the Reformed Church in the U. S. and of Franklin and Marshall College and Academy. Industries include the manufacture of caramels, cocoa, watches, linoleums, silk, cotton, locks,

hardware and metal products, iron works and machine shops. The surrounding country is a rich agricultural district, the principal products being wheat, corn, tobacco, poultry, and live stock. Lancaster was settled in 1718, and incorporated as a city in 1818. It was the capital of the State from 1799 to 1812; p. 61,345.

Lancaster, Duchy of, an English duchy created during the reign of Edward III. In 1351 the title of Duke was granted to Henry, Earl of Lancaster, as a reward for distinguished military services, and at the same time the dignity of a county palatine was conferred upon him. Following the War of the Roses Edward IV., of the house of York, in 1461 obtained an act of parliament 'for incorporating and also for confiscating the Duchy of Lancaster to the Crown of England forever,' and since then the ruling monarch has held the duchy with all its liberties and privileges. The chancellorship of the duchy is a political appointment and is usually held by a cabinet minister. Consult Baines' *History of Lancashire*; Fishwick's *History of Lancashire*.

Lancaster, Sir James (?1550-1618), English navigator, commanded one of the vessels in the attack upon the Spanish Armada in 1588. He went to India in 1601, returning three years later with rich spoil, and in 1596 captured Pernambuco in Brazil. After the organization of the East India Company he gave it the first footing at Atjeh and Java, returned to England, where he was knighted by Elizabeth, and there spent the rest of his life as a director of the East India Company. He interested himself in the project for discovering the Northwest Passage, and Lancaster Sound named by Baffin in his honor.

Lancaster, Joseph (1778-1838), British educator, founder of the Lancasterian system of education, was born in London. He devised the plan of having the older pupils teach the younger, *i.e.*, the monitorial system, and soon interested some of the nobility, who organized the Royal Lancasterian Society. From this grew the British and Foreign School Society, which established schools all over England and in parts of the Continent. In 1818 Lancaster made a trip to America, visiting the United States, Canada, Mexico, and South America, where his ideas were received with favor and several schools were established.

Lancaster Sound, a channel, connecting Baffin Bay and Barrow Strait, discovered by Baffin (1616), named in honor of Sir James

Lancaster and traversed by Sir William Parry in 1819.

Lancelot. See **Amphioxus**.

Lancelot du Lac, one of the heroes of the Arthurian legends, distinguished for his deeds of valor and as the lover of Queen Guinevere. Various poets have told of the love of Lancelot and Guinevere; notably Tennyson in his *Idylls of the King*. Consult Rhys' *Studies in the Arthurian Legend*; Newell's *King Arthur and the Round Table*; Weston's *The Legend of Sir Lancelot du Lac* in Grimm Library, vol. xii; Gray's *Lancelot of the Laik*, from the Cambridge University Library MSS.

Lancers, cavalry regiments carrying light lances. They were originally employed in the Cossack regiments of Russia, whence they were introduced into European warfare by Napoleon. The lance is from 8 to 11 ft. long, and carries a small pennon just below the point. Lancers are not employed in the United States service. See **CAVALRY**.

Lancewood, the wood of certain trees belonging to the genus *Oxandra* (*Bocagea*), a subdivision of the order *Anonaceæ*. It is tough and elastic.

Lan-chou-fu, or **Lanchow**, city, North China, capital of the province of Kan-su, on the right bank of the Hoang-ho. A brisk trade in silk, fur, metal and wooden articles, grain and tea is carried on, the city being at the convergence of the trade routes connecting China with Mongolia, Turkestan, and Tibet; p. 500,000.

Lanciani, Rodolfo Amadeo (1847-1929), Italian archaeologist, was born in Rome. He superintended many Roman researches of importance and published *I commentari di Frontino intorno le acque et gli acquedotti* (1880); *Ancient Rome in the Light of Recent Discoveries* (1888), comprising his American lectures; *Forma Urbis Romæ*, a plan of classic Rome in 46 plates, with historical text (1893-1901); *New Tales of Old Rome* (1901), etc.

Land, as opposed to water, occupies about two-sevenths of the earth's surface, covering an estimated area of 55,100,000 sq. m. For a discussion of its formation, of the forms which it has assumed under the influence of the multifold forces of nature, of its distribution and varied physical characteristics, see **GEOLOGY**, **GEOMORPHOLOGY** and **GEOGRAPHY**. The historical problems regarding the origin of property in land are discussed under the head **VILLAGE COMMUNITY**, and regarding the beginnings of land tenure in England

under MANOR and FEUDALISM. See also TENURE. England is the classical home of the large farm and of the capitalist farmer. In the United States the small farm operated by the owner is still the prevailing form, although in recent decades the proportion of farms operated by tenants has steadily increased. See AGRICULTURE; FARMING.

Economists have generally employed the term land in a technical sense, differing more or less from the ordinary usage. They have, on the one hand, extended the meaning to include all the resources which nature offers to man—the mines as well as the soil, the fisheries and the navigable rivers, the water power and the trade situation, as well as the natural properties of the soil. On the other hand, they have limited the term to the original and indestructible qualities of the soil. For a full discussion of land from the economic point of view, see LAND ECONOMICS. For legal phases of the subject, see PROPERTY; REAL PROPERTY; CONVEYANCING; RENT, and related subjects.

Landau, town, Germany, in Bavaria, 32 m. southwest of Mannheim. Notable buildings are the Augustiner-Kirche, dating from the 15th century, the Museum, and an early Gothic Collegiate Church, of the 13th century. The town gives its name to a four-wheeled carriage which was originally made there; p. 15,000.

Land Banks. Joint stock land banks were developed in the United States through provisions of the Federal Farm Loan Act of 1916. They made available to farmers long-time amortization loans and attained great popularity. In the industrial depression which began in 1929, the banks ran into difficulties and in December, 1931, a Senate committee was officially told that 23.5 percent of the loans were delinquent. Legislation to help the banks was enacted in 1932. On January 1, 1939, Land Bank loans amounted to \$1,985,000,000.



Land Crab

Land Crab, a member of the family Gecarcinidae, remarkable for the curious modification of the carapace in the region of the gills, which enables it to lead a terrestrial exist-

ence. The land crab is found in the warmer regions of both hemispheres; the best known species are the large Black or Mountain Crab (*Gecarcinus ruricola*) and the White Land Crab of Jamaica and the other West Indian Islands. Consult Gosse's *A Naturalist's Sojourn in Jamaica*.

Land Economics is that division of economics, theoretical and applied, which is concerned with the services of nature in production and with the human relationships which arise out of the use of land as property and as a source of income. As a branch of general economics, therefore, the economics of land is comparable and coordinate with what may be designated as the economics of labor, of capital, and of management. The land economist is concerned not only with the use of the surface of the earth but also with the use of water, air, electricity, and sub-surface deposits. The concepts of property, value, and income mark out the field of land economics. The human relationships which are comprehended in property rights to land and in the use of such rights to obtain an income are the field of inquiry by land economists.

Scope of Land Economics.—As a science, land economics aims to understand present facts in regard to land ownership and land utilization in all their human relationships; to explain their development in the past; and to discover present tendencies of growth. As an art, land economics aims to frame constructive land policies for particular places and times. These two aspects of the subject reveal the scope of land economics.

Characteristics of Land.—The most comprehensive treatment of land economics at the present time starts the analysis with a statement of the characteristics of land which generally set it off as a more or less distinct economic good. The physical characteristics of land are immobility, gradations in fertility and in advantages of location, and durability. The economic characteristics of land are its tendency to diminishing returns when the land is developed beyond a certain point, the relative scarcity of the economic supply of land, and the slowness with which land uses can be adapted to changes in prices. The social characteristics are the political and social power which attaches to land ownership, the increasing need for social control as intensity of use develops, and the tendency of land ownership to develop thrift, since it acts as a savings bank for many

people. For purposes of research a certain amount of specialization has crept into the subject of land economics. This specialization generally follows the natural division of the subject into urban land economics, agricultural land economics, forest land economics, mineral land economics, and the economics of water utilization.

Economy in the use of land means the proportioning of the economically available supply of land among its sundry uses in such a way that all demands will be most adequately satisfied with the least waste. Both public and private policies of land utilization are concerned with the application of this principle of proportionality or economy. In this connection the so-called ripening uses of land are significant. Theoretically defined, a ripening use is the holding of land out of present utilization until it is profitable to use it in some higher form. The ripening of land into uses gives rise to the law of the ripening costs of land utilization. Briefly summarized the law of ripening costs in land utilization is slated as follows: The costs falling upon the holder of land during a normal period of ripening use are socially necessary and are properly chargeable to the increase in land value resulting from the change in use.

The valuation of land implies the making of an estimate of the expected net income from the use of land over a period of years. In the United States the expected series of annual incomes is summarized in one figure which represents the present value of the succession of incomes and is called the capital value or selling value of the land. This process of capitalizing land income into a capital value is considered the heart of the problem of land valuation. In view of the importance of guiding present valuations and activities by estimates of what the future will bring a large part of economic thought is being devoted to the problems of forecasting prices, values, and trends of utilization. An adequate statistical basis is still lacking but will probably be an outstanding development in the future.

Land tenure as a part of land economics deals mainly with the human relationships involved in systems of property rights and with the effect of those relationships upon the utilization of natural resources. On the basis of this analysis certain policies of land tenure find general acceptance. The prevailing sentiment of land economists is distinctly favorable to private ownership of agricultural land with some measure of public con-

trol of private rights and a considerable public ownership of forest land. The attitude toward tenancy is that public tenancy is on the whole definitely undesirable, but that some private tenancy is both desirable and normal. The ideal policy is to encourage home ownership and owner-operation of farms, using tenancy, properly regulated to protect the rights of tenants and landlords, as a means of reaching the status of ownership.

Private ownership of land is in general the strongest inducement to rapid development and efficient use. Sometimes, however, the inducement is so strong that private owners exploit natural resources to the detriment of the public interest. Then it becomes economically and socially desirable to extend the sphere of public ownership or to curtail the 'intensity' of private rights without establishing full public property. This has been the general tendency in late years. Public ownership is regarded as most conducive to the conservation of natural resources.

The social side of private property has also developed rapidly in recent years, particularly in centers of population. Most economists will be inclined to support properly drawn city planning and zoning laws since they aim to stabilize land values and to economize the use of land. The growing tendency of public control of private rights to use land has found expression in a so-called principle of social control: The more intensive the use of land, the more highly developed must be the social control.

The taxes upon land which constitute the government's share of the income from land are receiving an increasing amount of attention from economists because of the influence of taxation upon the utilization of natural resources. In recent years the tendency has been for the government to take in taxes an ever larger proportion of the income from land. Due to inequities in the tax system in the United States, this tax burden has borne more heavily on real estate than on other forms of property. The consequence is a gradual approach toward the confiscation of land values, which eventually would mean a system of public ownership with public tenancy. The theory of a land tax has been that land, being immobile, durable, visible, and the gift of nature, is peculiarly fitted for taxation. There is considerable popular support for the proposal to make land alone bear the entire burden of governmental expenses, but among economists it has generally been

looked upon with disfavor. Particularly has this been true within the last few years, when the expenses of government have far outrun the total rent of land.

Another variety of land tax that is often suggested for the United States is known as the increment tax levied on the increase in land value determined when landed property changes hands. It has been pointed out, however, that the American system of levying the tax on an assessed capital value, instead of on present income already includes a substantial increment tax because the capital or selling value is very often based upon an expected increase in land value.

The theory underlying the present system of taxing land under the general property tax in the United States is founded ostensibly on the 'ability-to-pay' principle, formulated by Adam Smith in the *Wealth of Nations* (1776). Ownership of land signifies saved wealth or the possession of the ability to pay taxes. Many economists are calling attention to the fact that this puts a premium on spending and a penalty on saving. Consequently there is considerable scientific support for the view that some of the heavy direct taxes upon land should be transferred to indirect taxes upon certain forms of consumption, *i.e.*, that a broadening of the base of taxation is necessary to avoid confiscation of land values.

Lander, Frederick William (1821-62), American engineer and soldier, was born in Salem, Mass. He practised his profession as engineer for New England railroads until his appointment in 1853 as chief engineer of the Northern Pacific Railroad survey which, with another route to Puget Sound, he completed the following year. He was also chief engineer of the great overland wagon route. In the Civil War he served on General McClellan's staff, rising to the rank of brigadier general of volunteers.

Lander, Richard Lemon (1804-34), English explorer, was born in Truro, Cornwall. In 1825 he accompanied Clapperton's Niger expedition and on his return wrote accounts of it in his *Journal of Richard Lander from Kano to the Coast* (1829), and *Records of Captain Clapperton's Last Expedition to Africa* (1830). In 1830 Lander and his brother John (1807-39) were sent by the government to explore the lower course of the Niger. They ascended the stream as far as Yaoorie, 100 m. above Boussa, and eventually discovered its outlet into the Bight of Benin. During a later expedition to the Niger, Lander was

killed by the natives. Consult his *Journal of an Expedition to Explore the Niger* (1832).

Landes, maritime department, France, in the southwestern part, bordering on the Atlantic. It has an area of 3,604 sq. m. The portion to the n. of the Adour, three-fifths of the department, is known as the *landes*, and consists of tracts of sand, interspersed with marshes, and forests of cork, pine, and oak. Mining is extensively carried on, iron ore being the principal source of wealth. Rock salt is obtained at Dax and Lescaurre. Mont de Marsan is the capital; p. 263,937.

Landgrave, or **Count**, a German title of nobility instituted at the time of the Holy Roman Empire. It originally signified a count of unusual power and administrator, military leader, and also as judge.

Landis, Kenesaw Mountain (1866-1944), American jurist, was born in Millville, Ohio. In 1905 he became judge of the U. S. District Court for the Northern District of Illinois. He was presiding judge at the trial, in Chicago (June-July 1907), of the Standard Oil Company of Indiana for accepting rebates from railroads. In 1920 Judge Landis became the chief arbiter of disputes in baseball associations.

Land Laws, an expression commonly employed to describe certain legislative acts of the Parliament of Great Britain and the Congress of the United States radically altering the common law conception of tenure of lands or providing for the acquisition of property therein by the people. Of this character are the homestead laws of the United States and the Irish Land Laws enacted by Gladstone's government in 1870 and 1881 and by that of Lord Salisbury in 1887. For an account of this legislation see IRISH LAND LEGISLATION. For the ordinary law of property in land see PROPERTY; REAL PROPERTY.

Land League, The, a league of Irish tenants established in October 1879, and suppressed in 1881, perhaps the most powerful of the many organizations to which agrarian agitation in Ireland has given birth. Under the Coercion Act of 1881, Parnell and other officials were arrested and confined in Kilmainham prison, and the league was proclaimed as an unlawful association.

Landlord and Tenant, the relation subsisting between the lessor and the lessee of land. Any estate in land which is capable of subdivision may furnish material for the creation of a tenancy, the only requisite being that the lessor shall retain an interest in the

land conveyed. At the present time the relation of landlord and tenant is usually created by a form of conveyance known as a lease. This may within certain limits be by parol, but if for more than one year (in England and some of the States of the United States if for more than three years) is required by the Statute of Frauds to be in writing. The lease may be nothing more than a plain conveyance to the lessee of his limited estate in the premises, but it usually contains covenants or stipulations respecting the use to which the land may be put, the rent to be paid, the making of repairs, etc. In the

signment or by subletting, unless restrained by the terms of the lease. A lease, for however long a time and whether for life or for years, may be brought to an end by a reconveyance of the tenant's estate to the landlord, technically known as a surrender, or by the breach of a condition inserted in the lease. Under ordinary circumstances the relation of landlord and tenant comes to an end without ceremony or notice, except in the case of the indefinite tenancies known as tenancies from year to year, which require a notice of six months to terminate them at the end of a current year. In a few jurisdictions ten-



Photo from A. T. De La Mare Co., Inc.

Landscape Gardening.

absence of any such stipulations the law regulates the relations of the parties to one another in some important respects. The landlord is bound to protect the tenant against eviction, whether by the landlord himself, or by any one claiming under him or resulting from any defect in his title. The tenant on his part is under a strict legal obligation to do no act inconsistent with the landlord's claim of title, to make all needed repairs, and to refrain from committing waste or destruction on the premises.

The tenant, has the power to alienate his leasehold estate either by an out-and-out as-

ants at will are deemed entitled to notice.

Landon, Alfred Mossman (1887-), American oil producer, public official; was born at West Middlesex, Pa.; educated at University of Kansas. After working in a bank, he became a successful oil producer and was governor of Kansas 1933-37. He was the Republican nominee for President, 1936.

Landon, Arnold Henry Savage (1865-1924), English traveller, grandson of Walter Savage Landon, was born in Florence. He spent several years in visiting Japan, China, S. Mongolia, Korea, and other countries, and his name is associated with the two expedi-

tions which took him into the Kurile Islands (1893) and into Tibet (1897). The story of his visit to and his stay among the primitive inhabitants of Yezo and the Kurile Is. he told in his interesting book, *Alone with the Hairy Ainu* (1893). The expedition into Tibet with the object of penetrating Lhasa is described in *In the Forbidden Land* (1898). In 1906 he crossed Africa and in 1910-12 crossed South America from Rio de Janeiro to Lima.

Landor, Walter Savage (1775-1864), English poet and prose writer, born at Warwick. His residence, first at Como, then at Pisa, Pistoja, and Florence, was chequered by disputes with the local authorities; but he struck, in his *Imaginary Conversations*, upon a fertile literary vein of dialogued essay, which yielded many volumes. About 1857 his brain began to fail him. His works include *Miscellaneous Poems* (1795, 1800, 1802, 1831); *Collected Poems*, ed. Crump (1892). *Imaginary Conversations*, vols. I., II. (1824); vol. III. (1828); vols. IV., V. (1829); *The Pentameron* (1837); *Dry Sticks Fagoted* (1858); *Collected Works* (1846). See *Life*, by Forster (1869); *Landor*, by Colvin, in *English Men of Letters* (1884); *Walter Savage Landor*, by Evans (1892).

Landscape, from the scientific standpoint, is the complex of the phenomena seen from any place. Eliminating atmospheric or marine effects, the various landscapes are controlled by the composition and structure of the rocks, by the agents wearing them away or forming them, and by their covering of plant and animal life. See GEOMORPHOLOGY, GEOGRAPHICAL DISTRIBUTION OF PLANTS.

Landscape-gardening. Gardening on an artistic scale was practised by the Assyrians, the Greeks and Romans, and throughout Europe during the middle ages, yet the birth of landscape-gardening proper may be ascribed to Italy in the 15th century; and the most characteristic example now existing is the Boboli garden at Florence, laid out by Cosmo de' Medici. France next showed its interest in landscape-gardening in the gardens laid out by Francis I. at Fontainebleau, after his return from Italy. But all the French gardens were eclipsed by those of Versailles, where Louis XIV. commanded Le Nôtre to create for him 'a wonder of art such as the world had never seen.' This led to the designer's employment by William and Mary to emulate Versailles on a smaller scale at Hamp-

ton Court, St. James's, and Kensington Gardens. William Kent, a landscape painter, who, like Le Nôtre, had been educated in Rome, was employed to plan the parks of Richmond, Esher, etc.; while his able follower, 'Capability Brown,' remodelled Blenheim, one of the greatest of all landscape gardens. Large estates in the United States have afforded ample opportunity for landscape-gardening which has been generally availed of, have been developed to a high degree of artistic beauty. The parks of American cities, most of which possessed but little original natural beauty, are excellent examples of American landscape-gardening, and such work as that of Frederick Law Olmstead and Calvert Vaux has received universal appreciation. Landscape gardening is chiefly represented by two styles—the geometric or formal style and the English or natural style, the trend at present being toward the natural style both in design and planting. See Waugh, *Landscape Gardening* (1899); Parsons, *Landscape Gardening* (1891); Bailey, *Garden Making* (1900). See GARDENING.

Landseer, Sir Edwin Henry (1802-73), representative member of the English school of animal painting, came of a family of artists, his father being John Landseer the engraver, of whose other sons Thomas (1796-1880) and Charles (1799-1879) were respectively a celebrated engraver and an R.A. He exhibited in the Royal Academy (1815), was elected associate (1826), and became full member (1830). Queen Victoria and the Prince Consort made etchings from his designs, and a knighthood was conferred on him (1850). The famous bronze lions which he designed for Trafalgar Square were erected in 1869. See Wornum's *Epochs of Painting*, Stephen's *Sir Edwin H. Landseer* (1880), and Chesneau's *The English School of Painting* (1885).

Land's End, most. w. point of England, in Cornwall, 9 m. s.w. of Penzance, facing the Atlantic Ocean. It ends in granite cliffs, from 60 to 100 ft. high, fantastically carved by erosion. On Carn Bras, one of the rocky islets to the n.w., is Longships Lighthouse, erected in 1793.

Landsknechte, erroneously *Lanzknechte*, German mercenary soldiers of the 15th and 16th centuries, were first raised (1487) by the Emperor Maximilian, and won their greatest fame in the Italian wars of the first half of the 16th century. See Wessely's *Die Landsknechte* (1877) and Blau's *Die Deutschen Landsknechte* (1882).

Landskrona, seapt. tn., co. Malmöhus, Sweden, on the Sound. It has an old castle, a good harbor, iron foundries, and shipbuilding yards. Here, on July 14, 1677, Charles XI. defeated the forces of the invading Danes; p. 18,815.

Landslides, On sea coasts, as the wash of the waves undermines the base of the cliffs, there are often great falls of rock. Landslides are characteristic of mountain regions in which the valleys are deep and steep-sided. They are most common in spring when the snow is melting, or in autumn after heavy rains, and are often set in motion by the action of springs saturating or even removing some of the strata, and in this way forming lines of weakness. See Bonney's *Story of Our Planet* (1893); Geikie's *Physical Geography* (1884), and Lord Avebury's *Scenery of Switzerland* (2d ed., 1896).

Landsturm (lit. 'land-storm'), the name of one of the great subdivisions of the German army—a last line of military reserve, only called to arms during actual threat of invasion, and consisting of men who have passed through active, reserve, and Landwehr service, and who remain in the Landsturm till the age of forty-five, after which military obligation ceases.

Land Tax. Taxation has been levied on land in various ways at different times and places. It has sometimes, in the case of tithe, taken the form of a definite proportion of the produce, while in the case of Schedule A of the income tax it has varied according to the rent obtained. Some economists have held that the entire revenue of a nation should be raised by a tax on land believing that by this means wealth would be taxed at its source, and the burden of taxation fairly distributed. (See TAXATION.) Others would employ the taxation of rent as a mode of securing for the benefit of the community 'the unearned increment.' See RENT.

Land Transfer Reforms. See **Torrens System**.

Landwehr ('land defence'), a species of German and Austrian militia only called out in time of necessity. The name was first applied against the French. See LANDSTURM.

Lane, Edward William (1801-76), English Arabic scholar, was born in Hereford. His translation of *The Thousand and One Nights* (1838-40) was the first accurate version of the celebrated Arabic stories. His greatest work, the *Arabic-English Lexicon*, was the result of over twenty years' labor. Consult Lane-Poole's *Life*.

Lane, Franklin Knight (1864-1921), American cabinet officer, was born near Charlottetown, Prince Edward's Island. He was appointed to the Interstate Commerce Commission in 1905, and served until his appointment as Secretary of the Interior in President Wilson's Cabinet in 1913, which position he filled with great credit and usefulness until 1920. In 1916 he was appointed a member of the American-Mexican High Commission. He played an important part in the great movement for the conservation of national resources (see CONSERVATION).

Lane, George Martin (1823-97), American scholar, was born in Charlestown, Mass. He became professor of Latin at Harvard University, and was later Pope professor of Latin there (1869-94), and professor emeritus. His works include: *Latin Pronunciation* (1871), which led to the rejection of the English method of pronunciation.

Lane, Jonathan Homer (1819-80), American physicist, was born in Geneseo, N. Y. He invented several ingenious instruments; and wrote numerous memoirs on scientific subjects—one of which, *Theoretical Temperature of the Sun* (1870), contained the result, known as 'Lane's law' that gases rise in temperature as they contract, though radiating heat.

Lane, Sir Ralph (c. 1530-1603), was second to Sir Richard Grenville in the expedition sent out by Sir Walter Raleigh to found a colony in Virginia (1585). The colony was established on Roanoke Island; and on Grenville's departure, Lane was left as governor. The situation proved unfavorable, and in June, 1586, Lane and his companions returned to England in Sir Francis Drake's vessels. He took part in Drake's Portugal expedition of 1589, and for his share in suppressing an Irish insurrection in 1591 he was knighted.

Lane, Ralph Norman Angell, better known by his pen name, **Sir Norman Angell** (1874-), English author, passed his youth in the Western United States; was general manager of the *Paris Daily Mail*, 1905-14; editor of *Foreign Affairs*, 1928-31; M. P. *North Bradford*, 1929-31. In 1933 he was awarded the Nobel Peace Prize. He wrote *Patriotism under Three Flags* (1903); *The Money Game* (1928); *From Chaos to Control* (1933); *Patriotism versus Welfare* (1933); *Let the People Know* (1943), etc.

Lane, Richard James (1800-72), engraver and lithographer, grand-nephew of Gainsborough, was elected an A. R. A. in 1827. He became one of the foremost lithographers in

England, and proved himself a sculptor and draughtsman of merit. His most successful lithographs were after Gainsborough, Lawrence, Leslie, Chalon, and Landseer.

Lane-Poole, Stanley (1854-1931), English historian and Orientalist, was born in London, and graduated from Oxford in 1878. He turned to Arabic and numismatics, and compiled a *Catalogue of Oriental and Indian Coins* for the British Museum (14 vols. 1875-92), and *The Art of the Saracens* (1886).

crime (1910); *Les empires germaniques et la politique de la force* (1915); *L'idéal moral du matérialisme et la guerre* (1918), etc.

Lane Theological Seminary, a theological school established in 1829 at Cincinnati, Ohio, and opened in 1832. Its teachings are those of the Presbyterian Church, but students of all evangelical denominations are admitted. It was moved to Chicago and united with the Chicago Presbyterian Theological Seminary in 1931. Students pay no



A Picture by Landseer—'The Shepherd's Chief Mourner.'

His numerous publications include: *Histories of the Moors in Spain* (1887); *A Short History of India in the Middle Ages* (1917); *Saladin and the Fall of the Kingdom of Jerusalem* (1926). He was professor of Arabic at Trinity College, Dublin (1898-1904).

Lanessan, Jean Marie Antoine de (1843-1919), French public official. He studied medicine, and in 1875 became professor of natural history at Paris. In 1899-1902 he was minister of marine, and in 1898-1906 deputy for Lyons. He received decorations in Russia, Italy, Sweden, Japan, China, and other countries. He wrote *La République Démocratique* (1897); *La lutte contre le*

fee for tuition or rent and may obtain financial aid.

Lanfranc, (1005-89), first archbishop of Canterbury after the Conquest, was born in Pavia. In 1066 he was appointed abbot of the new monastery of Caen, founded by William Duke of Normandy. After the Norman Conquest of England, Lanfranc was induced by William, though reluctantly, to accept the see of Canterbury (1070), which he occupied with great spiritual benefit to the church until his death. He was the author of commentaries on Paul's epistles, a treatise *De Corpore et Sanguine Domini*, letters, and sermons. His complete works were published

in Paris by D'Archéry (1648), and an excellent edition, edited by Gilles, was issued at Oxford.

Lanfrey, Pierre (1828-77), French historian, was born in Chambéry. His chief work is *Histoire de Napoléon I* (1867-75), in which he gives an unbiassed picture of Bonaparte. His *Œuvres complètes* appeared 1879-85, and his *Correspondance* in 1885.

Lang, Andrew (1844-1912), British man of letters, was born in Selkirk, Scotland. He collaborated with Professor Butcher on an



Land's End, the Most Westerly Point of England.

excellent version of the *Odyssey* (1879). His *Aucassin and Nicolette* (1887) and his *Perceval's Popular Tales* illustrate his French accomplishments. Among his many works are *Lost Leaders and Letters on Literature* (1889); *Homer and the Epic* (1893); *The World of Homer* (1910); *Shakespeare, Bacon, and the Great Unknown* (1912); *Balads and Lyrics of Old France* (1872); *Grass of Parnassus* (1888); *Custom and Myth* (1884); *Magic and Religion* (1901); *Secret of the Totem*; *The Clyde Mystery* (1905); *History of Scotland from the Roman Occupation* (vols. I-IV, 1900-1907); *Short History of Scotland* (1911); *the Life of John Gibson Lockhart* (1896); and *Sir George Mackenzie* (1909). His *Blue Fairy Book* (1889) began a series of charming fancies in different colors, diversified by *My Own Fairy Book* (1895) and *Olive Fairy Book* (1907).

He edited the English Worthies Series, and editions of Scott, Burns, and Dickens, and wrote a valuable *Short History of English Literature* (1912).

Lang, Anton (1875-1938), member of the Passion Players of Oberammergau, playing the Christ in 1900, 1910, 1922, and speaking the prologue 1930.

Lang, Cosmo Gordon (1864-), archbishop of Canterbury, was educated at Glasgow University and Balliol College, Oxford. He was appointed honorary chaplain to Queen Victoria; became bishop suffragan of Stepney (1901-08) and a canon of St. Paul's (1901-08). In 1908 he was nominated archbishop of York; in 1928 of Canterbury. His writings include: *The Parables of Jesus* (1906); *The Opportunity of the Church of England* (1906). He visited America in 1918.

Langdon, John (1741-1819), American legislator, was born in Portsmouth, N. H. He gave his fortune to equip a brigade in which he himself served under General Stark at the Battle of Bennington. In 1783 he was re-elected to the State assembly; in 1787 was delegate to the convention that framed the Federal Constitution; in 1784-5 and 1788 president of New Hampshire; in 1789-1801 U. S. Senator (president of the Senate, 1789); in 1794-1804 U. S. Congressman; in 1803-05 again speaker of the State assembly; and was twice governor (1805-09 and 1810-12).

Lange, Johann Peter (1802-84), German Biblical exegete. His once popular *Theologisch-homiletische Bibelwerk*, in 22 vols. (1857), contains commentaries on all the books of the Bible, and was translated, under the supervision of Professor Philip Schaff, as *Theological and Homiletical Commentary on the Old Testament and the New Testament* (14 vols. and 10 vols. respectively, 1865-80). See Lichtenberger's *Histoire des Idées Religieuses en Allemagne* (1873; Eng. trans. 1889).

Langebek, Jacob (1710-75), Danish historian, early devoted to historical studies. In 1745 he founded a new Danish historical society, and succeeded Gram as record-keeper in 1748. His greatest achievement was the collection of mediæval documents entitled *Scriptores rerum Danicarum*, begun in 1772.

Langeland, Danish isl., about 30 m. long and $4\frac{1}{4}$ m. in breadth, lying between the Great Belt, the Baltic, and the Little Belt, Rudkjöbing, on the west coast, is the only town; p. 21, 120.

Langhorne, John (1735-79), English poet, born at Kirkby Stephen. He published *Poetical Works* (1766); *Plutarch's Lives*, in con-

junction with his brother (1770), which is still the standard translation. See *Memoirs*, by J. T. Langhorne, prefixed to edition of *Poetical Works* (1804).

Langlade, Charles Michel de (1729-1800), French Canadian trader and soldier, was born at Mackinaw, Mich. He led the Ottawas in the historic ambush resulting in the defeat of Braddock, on the Monongahela river, in 1755. He planned the ambush of Wolfe's army at Quebec (1759), and fought in the battle of the Plains of Abraham under de Levis. He was afterward appointed Indian agent and then commander-in-chief of the Canadian militia, and was paid an annual pension of about £150. During his later years he lived at Green Bay, Wis., and is still referred to as the 'father and founder of Wisconsin.'

Langland, William (?1330-1400), the probable author of *The Vision of Piers Plowman*, is one of the great figures in English literature, and one of those of whom least is known. In the *Vision*, move personified the great influences of that and of all time, as Holicherche, the Knight Conscience, Lady Mede (Mammon), the deceiver Fals, and the great central figure, Piers Plowman, at first the toiler at his furrow, but finally identified with the Christ Himself. The poem is in two parts—*The Vision of Piers Plowman*, and *Vita de Do-wel, Do-bet, and Do-best*. The three versions of the whole poem, all presumably the work of Langland, were produced between 1362 and a date after 1390. An edition of the texts has been prepared by Professor Skeat for the Early English Text Society; he has also edited for the Clarendon Press an edition of the *Vision* (1886; 6th ed. 1891). The traditional view accepted by Skeat and others of a single author, has been questioned by Professor Manly who asserts that Langland is a mythical person and that the *Vision* is really the work of five different men. See Jusscrand, *L'épopée mystique de William Langland* (1893); id., *A Literary History of the English People* (1895), and *The Vision and Creed of Piers Plowman*, edited by Wright (1897).

Langley, Samuel Pierpont (1834-1906), American astronomer and physicist, was born at Roxbury, Mass. He was professor of astronomy and physics at the Western University of Pennsylvania and director of the Alleghany Observatory, 1867-86, assistant secretary to the Smithsonian Institution, 1886-7 and secretary, 1887-1906. In 1869 he founded the system of railroad time service from

observatories. In 1881 he re-established the solar constant and discovered an extension of the solar spectrum. He invented the bolometer. He was the first to establish scientifically the principles upon which the propulsion of a plane surface through the air has since been successfully demonstrated. He built and flew 2 model steam-driven aerodromes of biplane type and Congress in 1898 voted him \$50,000 to make a machine that would carry a man. This machine was damaged in launching and as no more money was voted, the inventor died with his flying machine perfected but unflown. In 1914 it was repaired and flown by Glenn Curtiss.

Langmuir, Irving (1881-), American physicist and chemist, born in Brooklyn, N. Y., educated at Columbia University and Göttingen; instructor in chemistry at Stevens Institute, 1906-09; on the staff of the General Electric Co. from 1909; associate director of its research laboratories, from 1928. He won the Nichols, Hughes, Faraday, Rumford, Perkins, and Chandler medals, the Cannizzaro prize (1925), the Nobel prize (1932). Among his many inventions are the gas-filled electric lamp; electric welding by the atomic hydrogen method; and work on vacuum tubes leading to development of modern radio. He has published many valuable scientific papers.

Langtoft, Peter of (d. 1307), rhyming chronicler, composed a versified chronicle of English history, published first at Oxford, 1725; and by Thomas Thorpe in the Rolls Series 1866-8.

Langton, Stephen (d. 1228), English prelate, educated in France, became chancellor of Paris University. He was made cardinal, and archbishop of Canterbury by Innocent III. Siding with the barons in their conflict with King John, his was the first signature appended to Magna Carta. Division of the Bible into chapters is credited to him. See Hook, *Archbishops of Canterbury*, vol. II. (1862), and Stubbs, *Constitutional History*.

Langtry, Lillie, Mrs. (1852-1929), actress. In 1881 she made her début at the Haymarket Theatre, London, as Kate Hardcastle in *She Stoops to Conquer*. In 1882 she played Rosalind in *As You Like It*. She was lessee of the Prince's Theatre, and toured in America.

Language. See Grammar, Philology, Gender.

Languedoc, old s. prov. of France, between the Garonne and the Rhone, cap. Toulouse. Its name is derived from the Old Fr. *langue* and the Provençal *oc*. See Devic and

Vaissette's *Histoire de Langue-doc* (1873).

Langur, a monkey of the genus *Semnopithecus*, which contains Asiatic forms characterized by slender build, very long tail, absence of cheek pouches, and the fact that the hind limbs are longer than the fore.

Lanier, Sidney (1842-81), American poet, was born at Macon, Ga. He was in active service during the Civil War and was a prisoner for five months. In his novel, *Tiger Lilies* (1867), he portrays his war experiences, during which he contracted consumption, of which he died. He had devoted much attention to composing music for his own songs, and in 1873 he took a position as first flute for the Peabody Symphony Concerts, Baltimore. He continued to write poetry and his study of the relations between poetry and music are given in his *Science of English Verse* (1881). Principal among his poems are *Corn, Sunrise, The Symphony, Psalm of the West*, and the cantata written for the opening of the Centennial exposition. Mr. Lanier's poetry was collected and published as *The Poems of Sidney Lanier*, edited by his wife, with a Memorial by William Hayes Ward (1884). Consult his *Letters*, edited by his wife; Mims' *Sidney Lanier*.

Lanjuinais, Jean Denis, Count de (1753-1827), French statesman, was born in Rennes, France, and early gained fame as a barrister and lecturer. He became a member of the Senate (1800), and during the Hundred Days was president of the Chamber of Deputies.

Lankavatāra, one of the principal Mahayanist scriptures, an important work on Buddhist law and philosophy.

Lankester, Sir Edwin Ray (1847-1929), British physiologist and naturalist, was born in London. He was director of the natural history departments of the British Museum (1898-1906), president of the British Association for the Advancement of Science (1906). He wrote *Comparative Longevity* (1871); *Secrets of Earth and Sea* (1920); *Great and Small Things* (1923).

Lanman, Charles Rockwell (1850-1941), American Orientalist, was born in Norwich, Conn. He travelled in India, and made valuable collections of books and mss. for Harvard. As secretary, treasurer, president, and editor, he devoted many years to the work of the American Oriental Society and American Philological Association. He was elected in 1908 *Correspondant de l'Académie des Inscriptions et Belles-Lettres de l'Institut de*

France, being the second American to attain that distinction. His publications include: *Sanskrit Reader* (1888); *Hindu Pantheism* (1890); *Harvard Oriental Series* (1891-).

Lanolin, or Wool Fat, consists chiefly of cholesterin and fatty acids; formula, $C_{25}H_{43}OH$. It is prepared from 'suint,' or the grease of sheep's wool. As it is easily absorbed by the skin, it is extensively used as a basis of ointments.

Lansdowne, Henry Charles Keith Petty-Fitzmaurice, Fifth Marquis of (1845-1927), English statesman, received his first official appointment in 1869 as Lord of the Treasury in the Gladstone Ministry. In 1900 he became Secretary of State for Foreign Affairs. He held this post in the Balfour Cabinet (1902-05), during which period he concluded the *entente cordiale* treaty with France. In November 1917 he astounded the world with a letter in the *Daily Telegraph* suggesting that the Allies present their peace terms to the Central Powers and end the war, which was sternly rejected by the Allies.

Lansdowne, Henry Petty-Fitzmaurice, third Marquis of (1780-1863), English statesman. He held office under the Canning, Goderich, and Grey ministries (1827-34), lending valuable assistance in the passing of the Reform Bill (1832). He was twice offered the Premiership (1852, 1855), but declined.

Lansing, city, Michigan, Ingham co., capital of the state. In E. Lansing is the Michigan State College. The manufactures, fed by two rivers, include automobiles, automobile accessories and bodies, electric supplies, trucks, wheels, windshields, awnings and tents; p. 78,753.

Lansing, Robert (1864-1928), American lawyer and public official, was born in Wassertown, N. Y. He succeeded W. J. Bryan as Secretary of State in the Cabinet of President Wilson in July 1915, but resigned at the president's request in February 1920. In 1918-19 he was a member of the American Commission to negotiate peace. He became the associate editor of *The American Journal of International Law*. He wrote *The Peace Negotiations* (1921); *The Big Four and Others of the Peace Conference* (1921); *Notes on Sovereignty* (1921).

Lantern, in architecture, an ornamental structure, usually circular, crowning the dome or tower in Roman and Gothic buildings. Its position is over the intersection made by the crossing of the nave and transepts in a church

or cathedral. The Cathedral at Florence, St. Paul's, London, and Ely Cathedral are good examples.



Grey Friars.

King's Lynn

Lantern Tower.

Lantern Fly, an insect of the hemipterous family Fulgoridæ, so named because certain species, as the *Chinese Lantern Fly* (*Fulgora candelaria*), widely distributed in Asia, are popularly said to emit light.

Lanthanum, (La. 139.0) a metallic element of the rare earths, first separated by Mosander in 1837, occurring in such minerals as cerite, orthite, monazite, gadolinite, and others.

Lanuvium, ancient city, Latium, Italy. A celebrated temple of Juno Sospita was built here. It was the birthplace of Antoninus Pius (86 A.D.).

Lanzi, Luigi (1732-1810), Italian antiquary, born near Macerata. His chief works are his *Storia Pittorica della Italia* (1789-1806; Eng. trans. 1828); *Saggio di Lingua Etrusca* (1789).

Laocoön, in ancient Greek legend, a Trojan priest of Apollo, who tried to dissuade his countrymen from bringing into the city the wooden horse by which Troy was captured. He even smote his spear into its side. It was perhaps in punishment for this that, when he was sacrificing to Poseidon, two snakes came out of the sea, and first entwining themselves about his two sons, and then about him as

he hastened to their aid, killed all three, as is represented in the famous group found at Rome in 1506, and now in the Vatican. Virgil's description of the death of Laocoön in the second book of the *Æneid* is undoubtedly inspired by the marble group.

Laodamia, a daughter of Acastus, and wife of Protesilaus. After her husband's death at Troy, the gods granted her request that he might return from Hades to converse with her for three hours; when he departed from life a second time, she died with him. Wordsworth used the legend in his poem *Laodamia*.

Laodicea, the name of several cities in Asia Minor and Syria. The most important are: (1.) *L. AD LYCUM*, on the riv. Lycus, a tributary of the Mæander, in ancient Phrygia. The great 'eastern highway' passed through it, and it was one of the richest cities in Asia. (2.) *L. AD MARE*, about 50 m. s. of Antioch in Syria. It was founded by Seleucus 1. about 300 B.C., and its modern name is Ladikiye, or commonly Latakia. (3.) *L. COMBUSTA*, in Lycaonia, on the high-road from Ephesus to the East. Sorgan Ladik is on the site.

Laomedon, in ancient Greek legend, a son of Ilus and Euridyce, and father of Priam, Tithonus, and Hesione, was king of Troy, of which he was the founder.

Laon (Rom. *laudunum*), cap. and first-class fortress, dep. Aisne, France. It contains a fine 12th-century Gothic cathedral. In the 10th century it was the residence of the Carolingian kings. Here, in 1814, Napoleon was defeated by Blücher. During the World War, the city was occupied by the Germans in August, 1914, and held for over four years; p. 15,434.

Laos, general name for Central Indo-China, including the basin of the Mekong and the upper basins of the Menam and Salwin. The Siamese conquered the country at the beginning of the 19th century; p. 2,000,000.

Lao-tse (b. 604 B.C.), a celebrated Chinese philosopher, and said to be the founder of Taoism, one of the most ancient and important religions of China, was born at Keuh-jin, in the district of Koo. He is celebrated as the reputed author of the book *Tao-teh-king*, the principal object of which is to establish a knowledge of what are the qualities of superior men.

Laparotomy (Gr. *lapara*, 'the flank'; *tomē*, 'an incision'), in surgery, an operation involving the opening of the peritoneal cavity by means of an incision through the anterior abdominal wall, cæliotomy, especially through the flank.

La Paz, department, Bolivia. The southern part is mountainous, and contains the section of the Andes known as the Cordillera Real. The department has several of the highest peaks of the continent, notably Illimani (22,500 ft.) and Illampu or Sorata (23,500 ft.). Gold, silver, copper, and tin are mined; p. 736,985, five-sixths being Indians.

La Paz, city and *de facto* capital of Bolivia, in the department of La Paz. It has an important trade in agricultural and mining products and has railway connection with the coast; p. 146,930.

La Pérouse, Jean François de Galaup, Count de (1741-88), French navigator, was born near Albi. In 1785 he was employed by the French government to make a voyage of discovery round the world in the *Boussole* and the *Astrolabe*. After doubling Cape Horn, and exploring the Pacific coasts and Macao, and Hecker Island, making important discoveries from China to Kamchatka, he reached Botany Bay.

Lapham, Increase Allen (1811-75), American naturalist, was born in Palmyra, N. Y. He published several volumes on the plants, shells, topography, and geology of Wisconsin, and *Antiquities of Wisconsin* (1855), an investigation of the remains of a prehistoric people in that State. He was one of those who suggested the system of government weather reports and helped organize the 'signal service' at Washington (1870).

Lapidary Work. See **Gems**.

Lapis Lazuli, a mineral of opaque ultramarine or azure-blue color, used as a gem. It is found either massive or in crystals in granite and crystalline limestone, and is composed of sodium, aluminum, silica, and sulphur. It is found in China, Persia, Chile and Siberia.

Lapithae, in ancient Greek legend a people who dwelt in the mountains of Thessaly. They are referred to by Homer in his *Odyssey*, also by Diodorus, Pausanias, Ovid, and other ancient writers.

Laplace, Pierre Simon, Marquis de (1749-1827), the greatest of French mathematicians, author of the *Mécanique céleste*, was a native of Beaumont-en-Auge. Before completing his 24th year he had signalized himself by his discovery of the invariability of the mean distances of the planets from the sun. His researches embraced the whole theory of gravitation; and he had the high honor of perfecting the work of his predecessors. In 1796 he published his *Exposition du système du monde*, a compendium of astronomy

in which he sets forth his famous Nebular Hypothesis, a work considered one of the masterpieces of the French language. In 1799 the publication of *Traité de mécanique céleste* brought him world-wide fame.

Lapland, a territory, having no political existence at the present day, but so called because it is the home of the Lapps. It may be roughly described as the Arctic region of Norway, Sweden, Finland and the Kola peninsula, consisting mainly of mountain, forest, morass and glacial lakes. The climate is severe for most of the year. The average stature of the Mountain Lapps is from 5 ft. to 5 ft. 2 in., and they are generally taller than the coast tribes. Other characteristic features are their small, elongated eyes, high cheek-bones, snub noses, wide mouths, and pointed chins, with little or no beard, and thin, short legs. Their arrow heads were sometimes made of iron, sometimes of bone. Spears they used only for bear-hunting. Although they have abandoned their religion and many of their old customs, they mostly live a nomadic life as hunters and fishers, having large herds of domesticated reindeer which are their chief source of wealth.

La Plata, city, Argentine Republic, capital of Buenos Aires, province, 35 m. s.e. of Buenos Aires, and 3 m. from Ensenada, its port on the river Plate estuary. It has railway connection with Buenos Aires. The city only dates from 1882, and has grown with phenomenal rapidity. It has well laid out streets, spacious avenues and fine buildings, and is the seat of the provincial government. It has a university, observatory, and an excellent museum. The leading exports are cattle and agriculture products; p. (est.) 150,000.

La Plata, Rio de. See **Plata**.

Laplata Mountains, a group of mountains in southwestern Colorado, attaining an altitude of 13,185 ft. in Mount Hesperus. They are rich in gold, silver, and coal.

Lappenberg, Johann Martin (1794-1865), German historian, was born in Hamburg. He is the author of valuable historical works, notably *Geschichte von England* (1834-7), continued by Pauli (1853-81).

Lappmark ('Lapp Marches'), the five marches of Swedish Lapland, consisting of Asele, Umea, Pitea, Lulea, and Tornea, with an area of 44,667 sq. m. In the mountainous parts, which include the highest Swedish peak, Kebnekaise, 7,180 ft., are the sources of the numerous rivers of North Sweden which flow into the Gulf of Bothnia, also many lakes. The longest day lasts three

months in the northernmost parts; p. about 7,000.

Laprairie, town, Canada, in Laprairie co., Quebec. It is a popular summer resort, and there are sawmills, brickyards, canneries and foundries; p. 2,158.

Lapse, in law, the failure of a testamentary gift, valid at the time a will is made, due to a subsequent event which renders it inoperative, such, for example, as the death of the devisee or legatee before the will goes into effect. The death of such a devisee after the will had once gone into effect through the decease of the testator would not affect the validity of the devise in any way; his death before the will is executed would render the gift void *ab initio*. It is only when the devise might have gone into effect but has failed to do so that it comes under the description of a lapsed devise.

Lapsed (Lat. *lapsi*, 'slipped, fallen'), a name applied in early days to those Christians who under the stress of persecution were not true to their faith.

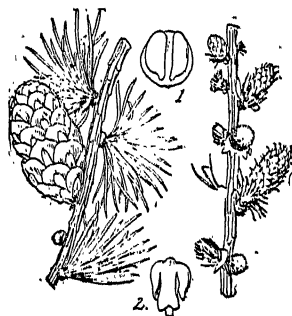
Lapwing, a handsome plover-like bird of Northern Europe and Asia (*Vanellus cristatus*), also known in Great Britain as peewit, or green plover. It is greenish above, with a black breast and white abdomen and cheeks, and has erectile plumes in the crest.

Laramie, city, Wyoming. The surrounding scenery is mountainous and picturesque. Laramie is the seat of Wyoming University, of the State Agricultural College and Experiment Farms, and of the State Fish Hatchery; p. 10,698.

Larceny, a term in its broadest sense at common law, which includes all forms of stealing or felonious taking of the property of another against his will with intent to deprive him of the use of it. At common law, if it was not complicated by some circumstance other than mere deprivation of property, it was known as simple larceny; however, if it was aggravated by additional elements of crime, as breaking and entering a dwelling house and stealing property therefrom, or taking property from the person of another under threat of death or bodily harm, it was known as 'compound larceny.' However, by statutes larcenies under particularly aggravated circumstances were classified under specific names, as burglary, robbery, embezzlement, obtaining money under false pretenses, etc. The tendency of modern penal codes seems to be to merge some of these classifications under the head of larceny, requiring only a statement of the facts

constituting the alleged offense. The New York Code classifies the degrees of the offense as follows: Grand larceny, of which there are two degrees, the first of which is punishable by imprisonment for a term not exceeding 10 years, and the second by a term not exceeding five years; petit larceny which includes taking property of less than \$25.00 in value, and is a misdemeanor, and punishable by fine or short imprisonment in discretion of court. The specific offences of burglary and robbery are more severely punished. Although all the States have not adopted this classification in the above form, it is practically the same in most of them.

Larch, or **Larix**, a genus of hardy, deciduous, coniferous trees of graceful habit belonging to the family *Pinaceæ*. There are about 10 species native to Europe, Asia and North America. The timber, which is hard and tough, is much used in shipbuilding and



Larch, Cone and Flowers
(male and female)

1. Scale of cone with two seeds; 2. anther

for railway sleepers, and in cabinet work is capable of taking a high polish. The species most commonly planted is *L. europæa*, which grows to about a hundred feet in height and is very ornamental. Other species are *L. occidentalis*, a tall and handsome American tree and *L. laricina*, the tamarack, or hackmatack, of North America.

Larcom, Lucy (1826-93), American poet, was born in Beverly Farms, Mass. She wrote for the *Lowell Offering*, the paper edited by a circle of mill girls, and gained the interest and friendship of Whittier. She was editor of *Our Young Folks*, 1866-74. Her best known poem is entitled 'Hannah Binding Shoes.'

Lard, hog fat that has been melted and strained to remove the connective tissue in

which it was supported when the animal was alive.

Lardner, Dionysius (1793-1859), Irish author of popular scientific works, was born in Dublin. He is best remembered as the initiator and editor of Lardner's *Cabinet Cyclopædia* (133 vols. 1830-49), to which he contributed many articles.

Lardner, Nathaniel (1684-1768), English Nonconformist divine, was born in Hawkhurst, Kent. The publication of his *Credibility of the Gospel History* (1727) at once placed him in the front rank of Christian apologists.

Lardner, Ring W. (1885-1933), American humorist and story-writer, was born in Michigan. At first a reporter of sporting news, he created the character of an absurd professional baseball player in *You Know Me Al* (1916), and later made large use of an acute familiarity with illiterate speech. Lardner's short stories, collected in *Round Up* (1930), are the best of their kind, and his fugitive writings collected in *First and Last Ring Lardner* (1934) reveal one of the most original comic personalities of modern times.

Laredo, city, Texas. Laredo is the seat of a Federal court, of Laredo Seminary (M. E. S.), an Ursuline convent (R. C.). Fort McIntosh here is a U. S. military post. Loma Vista Park is a popular resort. Coal is mined in the surrounding district, which is also rich in farm products and livestock; p. 39,274.

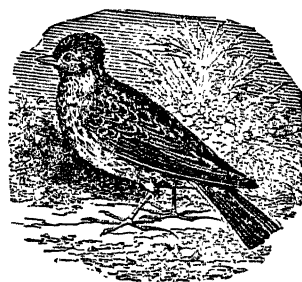
Lares, The, were objects of worship in ancient Rome; they included several classes—the tutelary deities of the house, whose images stood on the hearth in a shrine, or chapel; the lares of the crossroads; the lares of streets; lares of the country, and others. As worshipped in families, they represented the spirits of departed ancestors, though only good spirits were lares. See PENATES.

Largo, a term in music indicating a slow degress of *tempo* combined with breadth and dignity of style. *Larghetto*, the diminutive, indicates a slightly quicker time.

Larissa, town, Greece, in Thessaly. Remains of the ancient acropolis and theatre can still be seen. Larissa was ceded to Greece in 1881, and was an important mobilization center during the Second Balkan War. In 1917, during the World War, Larissa was occupied by the Franco-British forces; p. 23,899.

Lark, a small bird of the passerine family *Alaudæ*. Larks are generally of a brownish

color, more or less streaked with black, white, or yellow. The head is often crested. They are usually sociable and gregarious birds, and are frequently beautiful singers. Some are desert birds; others, as the Wood Lark, haunt wooded country; while the Skylark prefers open districts. All nest on the ground and lay spotted eggs. There are about a hundred species confined chiefly to the Old World, most numerous in the open parts of Africa. North America has a single genus—the Shore Lark.



Common Skylark.

Larkhana, town, India, in Sindh, Bombay. The neighborhood is known, from its productivity, as the 'Eden of Sindh.' Cotton, silk, leather, and paper are manufactured; p. 16,000.

Larkspur. See *Delphinium*.

Larnaca, or **Larnaka** (anc. *Citium*), chief seaport of Cyprus. The most important buildings are the Capuchin convent, the Church of St. Lazarus, and the old fort, now used as a prison. Grain, cotton, fruit, and gypsum are exported; p. 8,855.

La Rochefoucauld, François, Duc de (1613-80), Prince de Marcillac, a descendant of one of the most ancient families of France, was born in Paris. A liaison with the beautiful Madame de Longueville (1645) encouraged his participation in the Fronde (1648). After 20 years of fighting and intriguing, he retired from public life, and passed his leisure in the elaboration of his *Mémoires* and *Maxims*. In literary merit and historical value these *Mémoires* rank among the best of their time. The first edition of the famous *Maxims—Réflexions or sentences et maxims morales*—appeared in 1665. In their union of perspicuity, terseness, and polish the *Maxims* are unsurpassed.

Larousse, Pierre Athanase (1817-75), French lexicographer, was born in Toucy.

His fame rests on his vast encyclopædia, published under the title of *Grand dictionnaire universel du XIXe siècle* (1866-76). A new and abridged edition of the encyclopædia was published in 1898-1904, under the title *Nouveau Larousse illustré*. Other revised and abridged editions have since appeared.

Larrey, Dominique-Jean, Baron (1766-1842), French surgeon, was born in Baudéan. Being impressed with the unnecessary loss of life caused by the delay in removing the wounded from the battlefield, he instituted the *ambulances volantes*, flying hospitals, which proved of great value in lessening fatalities. He also made other contributions to surgery.

Larrimore, Francine (1898-), actress, born in France, was educated at the Normal School, now Hunter College, in New York City. In 1922 she was married to Con Conrad, divorced in 1924. Has starred in *Nice People*, *Shooting Star* (1933) and other plays.

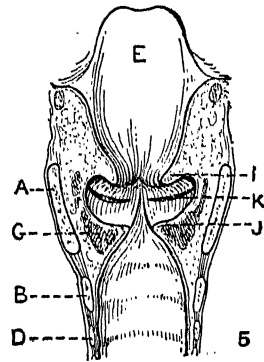
Larva (Latin, a mask), a name which was originally applied only to the young stages of insects differing strikingly from the adults in appearance, but which by extension is now generally applied to the young of animals when they do not closely resemble their parents. Thus the tadpole is the larva of the frog, the maggot is the larva of the fly. It is, however, a necessary part of the definition of the term that the young be adapted for a free-living existence, usually under conditions differing from those to which the adult is fitted.

Laryngismus, partial closure of the glottis, due to spasmodic contraction of the muscles of the larynx, either reflex or caused by an inflammatory process. *Laryngismus stridulus*, 'false croup,' 'spasmodic croup,' or 'child crowing,' is a variety of laryngismus in which the glottis is almost closed and inspiration is temporarily arrested. The condition is due to nervous derangement, and is often associated with rickets.

Laryngoscope, a small circular mirror attached at an angle of about 120° to a slender handle, by which in examinations of the throat it is placed in the pharynx with its back against the uvula, and so manipulated that its surface reflects the interior of the larynx, or, when inverted, that of the nasopharynx. The instrument was invented (c. 1855) by Manuel Garcia (1805), a teacher of singing, who used it primarily to observe the mechanism of his own vocal organs

during phonation. Soon after its invention Dr. Czermak, of Pesth, introduced the laryngoscope into medical practice, in which it is much used as an aid to diagnosis in laryngeal and post-nasal diseases.

Larynx. In man the larynx lies in the upper and front part of the neck, between the base of the tongue and the upper end of the trachea. It consists of a tubular framework of nine cartilages, which are connected with each other by joints, membranes, ligaments, and muscles. The largest of these cartilages is the thyroid, which is shield-shaped, and consists of two lateral wings diverging from a vertical central ridge in



The Larynx.

A, Thyroid cartilage; B, cricoid cartilage; C, rings of trachea; E, epiglottis; D, thyroarytenoid muscle; I, false vocal cords; J, true vocal cords; K, ventricle.

front. The upper part of the ridge forms the pomum Adami or Adam's apple of the throat, and is more prominent in men than in women, because of the greater size of the thyroid cartilage in the male sex. Above and in front of the thyroid cartilage is a thin leaf-like structure, the epiglottis, which during ordinary respiration stands erect at the back of the tongue, but during the act of swallowing is pushed backwards and downwards so as to bridge over the upper opening into the larynx and ensure the passage of food into the gullet behind. The chief pathological affections of the larynx are new formations, paralysis, and various forms of laryngitis.

La Salle, city, La Salle co., Ill. Its manu-

facturing industries include zinc rolling mills and zinc smelting works, and manufactures of clocks, brick, cement, glass, ploughs and farm machinery. La Salle was settled about 1837 and named after Sieur de La Salle, the great French-Canadian explorer; p. 12812.

La Salle, Robert Cavalier, Sieur de (1643-87), famous French explorer in N. America, the first man to pass down the Mississippi river from the French possessions in the n. to the Gulf of Mexico. He was born at Rouen, France. He is remembered chiefly for his expedition of 1678-82, during which, after overcoming manifold hardships and showing indomitable perseverance, he reached the Mississippi river by way of the Great Lakes and the Illinois river, establishing a fort (Fort Crèvecoeur) on or near the site of the present Peoria, Ill., and leagu-ing together the Illinois Indians to fight back the Iroquois, and passed down the Mississippi river (1682) from the mouth of the Illinois to the Gulf of Mexico, taking possession of the region about the mouth of the river for Louis XIV., in whose honor he called the surrounding country 'Louisiana.'

Lascar (a camp-follower or soldier; from Hindustani and Persian *lashkari*) is now freely applied to sailors of East Indian birth serving on European ships.

Lascaris, Constantine (d. c. 1493), a pioneer of Greek learning in the West. His Greek grammar, *Erotemata* (1476), was the earliest printed Greek book in Italy.

Las Casas, Bartolomé de (1474-1566), bishop of Chiapa, Mexico, called the 'Apostle of the Indians,' was born at Seville. After studying at the University of Salamanca, he joined an expedition of Columbus to the W. Indies (1498-1500), and subsequently went to Haiti, where he took holy orders. After some years spent in Europe, he accepted the bishopric of Chiapa in 1544. He left *Veynte Razones* ('Twenty Reasons' in support of Indian freedom); *Brevissima Relación de la Destrucción de las Indias* (1552), and other works.

Las Cases, Emmanuel Augustin Dieudonné Marin Joseph, Count de (1766-1842), French historian, born near Revel in Languedoc. After Waterloo he accompanied the ex-emperor to St. Helena, and there wrote at his dictation the *Mémorial de Sainte Hélène* (1821-3).

Lasker, Eduard (1829-84), German publicist. He strove earnestly towards the uni-

fication of Germany, and took a chief part in remodelling the judicial system (1867-77). The action of Bismarck in returning undelivered through the German minister at Washington resolutions of condolence passed by the House of Representatives and forwarded to Minister Sargent at Berlin for presentation to the Reichstag, gave rise to 'the Lasker incident.'

Lasker, Emanuel (1868-1941), German chess player, born at Berlinchen, Brandenburg. He defeated Blackburne in London (1892), and Steinitz in America (1894), winning the game at St. Petersburg (1896). He lost his title to Capablanca 1920, 1921, but regained it 1924.

Laski, Harold (1893-), English political economist, was born in Manchester, son of a Jewish merchant; educated at Oxford; 1914-16 was lecturer at McGill, Harvard, Amherst, Yale; 1926-41, professor of political science at the Univ. of London. After World War I he became the intellectual spokesman of the British Labor Party and gained international reputation. In 1945, with the Labor Party in power, his prestige as adviser was enhanced. He was an advocate of socialism; his theme, overthrow of capitalism by 'revolution by consent.'

Las Palmas, chief tn. on N.E. shore of Grand Canary Is., prov. Canaries, Spain.

Lassalle, Ferdinand (1825-64), the most brilliant and picturesque of German socialists, was foremost among the founders of the Social Democratic party in Germany. Between the ideas and methods of Marx and those of Lassalle there is a great difference. Marx was an internationalist; Lassalle was an ardent patriot, a fanatical advocate of German unity, which gave him influence over Bismarck, and liberalized Prussian domestic politics for a time. The Social Democratic party which he and Marx jointly founded adopted Marx's collectivism as its program, but it confined itself within national limits. The story of his life is the basis of Meredith's novel *The Tragic Comedians*.

Lassell, William (1799-1880), English astronomer, was born at Bolton, Lancashire. He built an observatory at Starfield, near Liverpool, and constructed a two-foot speculum, with which he discovered the satellite of Neptune (1846). The same instrument disclosed Saturn's eighth satellite, Hyperion (1848), and the inner Uranian satellites, Ariel and Umbriel (1851). In 1861 he

mounted a four-foot equatorial reflector at Malta, and catalogued with it, during three years, 600 new nebulae.

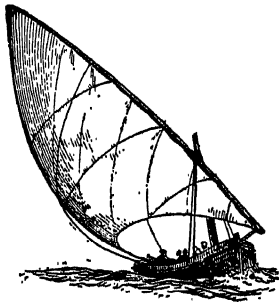
Lassen, Eduard (1830-1904), Danish composer, born at Copenhagen; became widely known in Belgium for several notable operatic works and popular songs. After the retirement of Liszt from the Court Theatre at Weimar, the baton was transferred to Lassen, and he there successfully produced Wagner's *Tristan and Isolde* (1874). He is the composer of operas *Le Roi Edgard* (produced by Liszt, 1857), *Frauenlob* (1860), *Le Captif* (1865), a ballet *Diana*.

Lasso, a plaited rope of raw hide, hair, or hemp, provided with a running noose at one end, and used by ranchmen and others for capturing or bringing down cattle.

Las Vegas, city, New Mexico. The old Santa Fé trail passes through here and is a remarkable mountain road. The old Spanish manor houses are also of scenic interest. Hot springs, 6 m. distant, are much resorted to. The altitude of the hot springs is 6,714 ft.; p. 12,362.

Latacunga, chief tn. in Leon prov., Ecuador, S. America. It has frequently been destroyed by earthquakes, notably in 1797. Contains former palace of the Incas. Trade in saltpetre; p. 15,000.

Latakia, or **Ladikiyeh** (anc. *Loadicea ad Mare*) seapt. in Beirut vilayet, Syria. Exports barley, cotton, wax, sponges, and the famous Latakia tobacco; p. about 22,000.



Boat with Lateen-sail.

Lateen-sail, a triangular sail extended on a yard which is slung about one quarter from the lower end to a mast, and rigged in such a way that the upper end is raised in the air, and the lower end is brought down to form the tack. The word is merely a corruption of 'latin,' and the rig is mainly used in the Mediterranean and on sailing canoes and small boats.

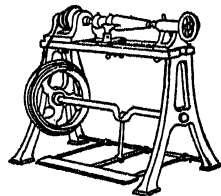
Latent Heat, the name given to the amount of energy which is absorbed by unit mass of a substance as it changes its state from solid to liquid or liquid to vapor. The change is usually effected by the application of heat, and what is observed is that as the change of state is being accomplished the temperature of the mixed states does not change.

Lateran, St. John, a celebrated church in Rome, regarded as the first and most illustrious in the Roman Catholic communion. It stands on a site originally occupied by the palace of the Laterani family, which palace was confiscated by Nero, and subsequently was ordained as the patrimony of the popes of Rome by Constantine, and was occupied by them till the 14th century. The present structure is of composite character, but includes a few fragments of the basilica built by Pope Sylvester I. in 324. Here five œcumenical councils have met, hence called Lateran councils.

Laterite. Laterite is a fine red or brown earth, a characteristic surface accumulation of tropical countries such as India, Arabia, and the Sahara. Many laterites are rich in iron oxide; others are aluminous. They are formed by the decomposition of the underlying rocks in tropical climates.

Latham, Robert Gordon (1812-88), English philologist, ethnologist, and physician, born at Billingsborough, Lincolnshire. He was the author of *The English Language* (1841). He was one of the first to suggest a probable European origin for the Aryans.

Lathe, a contrivance for shaping or 'turning' wood, metal, or ivory into forms of a circular or oval section. The simplest form of lathe, and one which is still generally used in India, consists of two rigid centers, be-



Lathe for Wood-turning.

tween which the object is revolved by means of a piece of cord wound round it, and pulled alternately backwards and forwards.

Lathrop, George Parsons (1851-98), American author, was born at Honolulu, Hawaiian Islands. Mr. Lathrop was assistant

editor of the *Atlantic Monthly*, 1875-7, and editor of the *Boston Courier*, 1877-9. In 1879 he bought Hawthorne's former home, 'The Wayside,' at Concord, Mass., where he lived for four years, occupied with his literary labors. Of his books may be mentioned *Rose and Roof-tree*, verse (1875), and an excellent travel-volume, *Spanish Vistas* (1883).

Lathrop, Rose Hawthorne (1851-1926), author, second daughter of Nathaniel Hawthorne, was born at Lenox, Mass. Mrs. Lathrop contributed many poems, stories, and sketches to the magazines, and much literary material to children's periodicals. Some of her poems were collected as *Along the Shore* (1888), and she also published *Memoirs of Hawthorne* (1897). In 1896 Mrs. Lathrop, known as Mother Mary Alphonsa Lathrop, superioress of the Dominican Community of the Third Order, devoted herself entirely to the management of a charitable home in New York.

Lathyrus, a genus of mostly climbing plants belonging to the order Leguminosæ. The genus includes many species. Among the American species are *L. maritimus*, known as the 'beach pea,' the purple-flowered *L. ornatus*, and the cream-colored vetchling (*L. ochroleucus*).

Latimer, Hugh (?1485-1555), English reformer. The emancipation of the country from the Pope's authority in 1534 went far to establish the position of Latimer, who was free to preach the reformed doctrines throughout the land—a work for which he was especially fitted. In 1546-7 he was imprisoned in the Tower, but enjoyed a few more years of remarkable success as a preacher before Mary's accession in 1553 threw him again into prison. After much suffering, he went with Ridley to the stake at Oxford. Marked above all by vigor and sincerity, the character and work of Latimer place him high among the world's reformers.

Latin Empire. See *Byzantine Empire, Rome*.

Latin Language and Literature. 1. *Language.*—The Latin language, originally the speech of the inhabitants of Latium, belongs, like the Greek, to the Indo-European (Indo-Germanic, Aryan) family of speech. It is classified with the Italic group of languages, other members of which are the Oscan and Umbrian and some minor dialects. This Italic group of languages, in vocabulary, declension, and conjugation, presents many points of resemblance to the Greek, but it is now clearly proved that the closest affinities of

the Italic group of languages are with the Celtic dialects—Welsh, Cornish, Breton, Manx, Erse, and Gaelic. The Latin language resembles the other Indo-Germanic languages in being synthetic and inflectional—it expresses differences of case, number, and gender in nouns and adjectives, and of person, tense, mood, and voice in verbs, by various suffixes which have no meaning apart from the form in which they are found, and not by prepositions, auxiliary verbs, and the like, as in English and most modern languages.

The Latin alphabet was derived from that used by the Greek colonists in Italy, and most probably from Cumæ in Campania. The Latin accent differed from the Greek in being a stress accent like that of English or modern Italian. Regarded from the point of view of its sound, the Latin language was less euphonic and heavier than the Greek—its words possess a greater number of consonants in proportion to vowels. The Latin vocabulary again, as compared with the Greek, is deficient. Roman writers themselves were well aware of this deficiency, like Lucretius, who complains of the *patrii sermonis egestas*, 'the poverty of our native speech.' This deficiency is due partly to the positive lack, first, of certain forms, which seriously diminish the shades of expression possible to the language; partly also to the absence of many words denoting abstract ideas. In terms of law, administration, and warfare—the true spheres of Roman genius—the language is rich and abundant. Generally it may be said that the vocabulary suited the needs of practical life—of the farm, the law court, the assembly, and the camp—and was less adapted to the requirements of the poet, the philosopher, the scientist, and the critic. The best testimony to the usefulness of the vocabulary is its wide adoption of modern languages, such as our own and the German, which are not directly derived from it. As already suggested, Latin increased its vocabulary largely by borrowing from Greek, and also to a less extent by borrowing from other Italic dialects and from Celtic.

The highest qualities of Latin are perhaps to be found in its methods of expression and construction, which again illustrate its practical character. Particularly to be observed are its preference of concrete to abstract expression, its logical arrangement of clauses, and the precision with which it subordinates the subsidiary ideas to the chief thought in the sentence. It may not be capable of expressing delicate shades of meaning, but it

certainly does not leave its meaning in doubt. Hence the great value of its study as an instrument of education: the constructing of a complex sentence requires as careful and strict an application of rules as the working out of a mathematical problem.

Latin can hardly be said to have possessed any dialects, or, if it had, they have left scarcely any traces. It was, of course, originally the speech of a small nation, the Latins; the aggrandizement of Rome caused it to spread over Western Europe, and to some extent toward the East, but the varieties so produced in it can scarcely be ranked as dialects. It is, however, clear that in many respects the language of the populace differed from the literary Latin which has come down to us in books. This is proved by the fact that many common words in the Romance languages are derived, not from their equivalents in classical Latin, but either from words used in slightly different or special senses in classical Latin, or from words not found at all in the best writers. The purest Latinity is generally held to be that of the first century B.C., represented by writers such as Cicero, Cæsar, Sallust, and Livy in prose; Lucretius, Catullus, Virgil, Horace, and Ovid in poetry. The Latin of the 1st century A.D.—the period often called the Silver Age—shows a degeneration of the admission of foreign, chiefly Greek, idioms and words; and this degeneration increases with the successive centuries. The barbarian invasions did much to corrupt the vocabulary; yet it was not until long after the fall of the Western empire, in 476 A.D., that Latin ceased to be the speech of Italy, and yielded to its descendant Italian. For many centuries longer Latin continued to be the common language of scholars, and, until the 17th century, of diplomatists.

The discussion of the Latin language cannot be concluded without the mention of its importance as the mother of the Romance languages. Its relation to them is particularly interesting, as it corresponds with that of the original Indo-Germanic languages of the various Indo-Germanic tongues, such as Latin itself, Greek, Aryan, Celtic, Teutonic, and the rest; and thus it illustrates the development of their languages from the parent speech. It has been pointed out in a preceding paragraph that the Romance languages descend from the language of the common people, the soldiers and traders who settled in the provinces, and not from the literary language. These Romance languages cover

fairly accurately the area of the Western empire of Rome; in the Eastern empire Latin failed to displace Greek. From Britain the Anglo-Saxon invasion expelled the Latin speech, if it had taken root there, as the Sarcenic invasions expelled it from Africa. Apart from this some form of Roman speech still marks the ancient limits of Roman rule. These languages are the Italian, French, Provençal, Spanish, Portuguese, Wallachian, and Rhaeto-Romanic. For the study of any one of them, and still more for the comparison of any two or more, a knowledge of Latin is indispensable. However, the acquisition of that knowledge is sufficiently demanded by the greatness of the Latin literature, to which we now proceed.

2. *Literature*.—The Latin literature, or the literature of ancient Rome possesses a history which covers some seven or more centuries. Its beginning may be dated with almost absolute exactness at 240 B.C., that year in which the first Latin play was exhibited at Rome. Various dates may be assigned for its close, such as 404 A.D., the year of Claudian's death; 476 A.D., the date of the abdication of Romulus Augustulus, the last of the Western emperors; or 524 A.D., the year in which Boëthius perished. Adopting the last date, so as to include in the present survey his interesting and important work, we assign a duration of over seven and a half centuries to the life of Latin literature.

(1.) The Republican Age (240 to 27 B.C.). Latin literature, more perhaps than that of any other nation, was essentially imitative and artificial; no doubt in early days rude hymns and ballads were produced, but nothing approaching the rank of literature existed until Greek influence began to make itself felt. Three names deserve special mention as the founders of the literature—those of Livius Andronicus, Nævius, and Ennius. Of the three it is to be noted that Nævius alone was a native Latin. Andronicus (c. 284-204 B.C.) translated Greek plays into Latin, the first of which appeared about 240 B.C.; and also translated the *Odyssey*, and, it is to be remarked, into the native Saturnian verse. Gaius Nævius (c. 264-194 B.C.) was a figure of greater distinction. He also translated Greek plays, but went further in writing original plays on Roman subjects, and in composing an epic—still in the Saturnian metre—on the Punic wars. Quintus Ennius (239-169 B.C.) was a native of Calabria. He was the first regular literary man of the Western world—writing on grammar, spelling, pro-

nunciation, meter, and even on shorthand, in addition to his more ambitious works in tragic and epic poetry. Important was his epic, the *Annales*, a history of Rome in eighteen books, from the landing of Æneas to his own day. In it he used the Greek hexameter measure with such success as to make it for all time the chief Roman meter. Comedy at Rome was contemporary with tragedy. Titus Maccius Plautus (254-184 B.C.) wrote perhaps some forty-five plays, of which twenty are extant. All are adaptations, not to say translations, from the Greek, as indeed were also all the works of Cæcilius and Terence. His plays represent every variety of comedy, from the *tragédie bouffe* to the farce. His best works are perhaps the *Amphitryo*, the *Trinummus*, the *Aulularia*, and the *Rudens*—a comedy with an unusually romantic setting. The influence of Plautus on modern comedy is unmistakable. Of Cæcilius (fl. 180 B.C.) little is known; only fragments of his work survive. Terence—in full Publius Terentius Afer (185-159 B.C.)—differed from Plautus in preserving not only the Greek setting but also the Greek spirit and tone in his plays. The comedy of Plautus is Roman in all but origin; that of Terence Greek in all but language, hence his plays were never popular at Rome.

At Rome, as everywhere else, poetical literature was earlier in date than prose; and at Rome, too, the usual rule obtained that the earliest form of prose writing was devoted to historical records. Marcus Porcius Cato (234-149 B.C.) was the founder of Latin prose literature. His works included more than 150 speeches; the *Origines*, a work of discursive history, intermixed with geography, politics, and personal reminiscences; and the *De Re Rustica*, on farming; but only the last is extant. The most important literary figure of the second half of the 2nd century B.C. was Gaius Lucilius (180-103 B.C.), the founder of the Roman *satura*—a term the original meaning of which was not satire, but 'a medley,' a composition of miscellaneous contents, and which was first applied to a rude kind of drama lacking a plot, afterwards to sketches of social life and character, and finally developing into that criticism of popular manners and habits, and even of individuals, which is denoted by the word satire in its modern sense. Lucilius called his satires *Sermones* ('Talks'), a title afterward adopted by Horace. Lucilius has the credit of having invented the one original department of Latin literature which has been imitated by such

modern writers—not to mention the professed satirists—as Montaigne and Pepys. Marcus Tullius Cicero (107-43 B.C.) is in many ways the chief figure in Roman literature. His excellence is not confined to a single department. Of his speeches, of which the Verrine, Catilinarian, and Philippic orations are perhaps the chief; his treatises on literature, such as the *De Oratore*, the *Brutus*, and the *De Optimo Genere Oratorum*; his philosophical works, like the *De Finibus*, the *De Amicitia*, and the *De Officiis*; and his Letters—any one of these forms of literary production would have sufficed to give lasting renown to any orator, critic, philosopher, or letter-writer undistinguished in any other branch of composition. His experiments in poetry assisted one of the greatest of Roman poets—Lucretius, who clearly studied and imitated them. Titus Lucretius (91-53 B.C.) is practically unknown except by his great poem, *De Natura Rerum*. Of his poem—the subject of which is the Epicurean philosophy—it can safely be said at its best it reaches a height of majesty unequalled by any Roman poet, and by few poets of any nation. Younger contemporaries of his were Cinna, Salvus, and Catullus, of these Gaius Valerius Catullus (c. 84-54 B.C.) alone calls for notice. Catullus's fame rests chiefly on those of his poems which celebrate his love for Lesbia—poems which, for their direct expression of feeling, have never been surpassed.

Cæsar (102-44 B.C.) is the chief representative, after Cicero, of the Latin prose of the republic, though his extant work is limited to his *Commentaries* on the Gallic and the civil wars. But his speeches and letters were held to be unexcelled even in that age; he also wrote on grammar, on astronomy, and two attacks on Cato. As a model of pure Latinity, Cæsar ranks with Cicero alone. The one remaining figure of the republican period is M. Terentius Varro (116-27 B.C.), whose career began before that of Cicero, and ended in the year of the establishment of the empire. Of his 600 or 700 volumes only one on agriculture and six (out of twenty-five) on the Latin language are extant. Most of his works were antiquarian and scholarly rather than literary in the true sense.

(2.) The Augustan Age (27 B.C. to 14 A.D.).

—The Augustan age is one of those remarkable periods of human history, like that of Pericles, of Elizabeth, of Louis XIV., and of Anne, which are distinguished by the contemporary appearance of several geniuses of a high order. It can boast of five poets of the

first rank (Virgil, Horace, Propertius, Tibullus, and Ovid), and of one great historian (Livy), besides minor writers. It is his expression of this Roman spirit that has justified the claim of Virgil to be considered the representative poet of Roman literature. His chief works are the *Eclogues*, pastoral idylls in the manner of Theocritus; the *Georgics*, on husbandry, imitated from Hesiod; and the *Æneid*, the model of which is the epic of Homer. Quintus Horatius Flaccus (65-8 B.C.) was a friend as well as a contemporary of Virgil; but he differs from him entirely in being a thorough man of the world, while Virgil was always a recluse. Whether in his *Odes*, his *Satires*, or his *Epistles*, Horace always shows the same polished worldly wisdom, combined with humor, geniality, good sense, good feeling, and good taste. In perfection of verbal and metrical finish he is not surpassed even by Virgil; he brought Latin lyric meters to such a point that no successor could follow him without imitation, or desert his example without disaster, and thus with him Latin lyric poetry ended. Ovid—in full, P. Ovidius Naso (43 B.C. to 18 A.D.)—is remarkable as the most productive of Roman poets. He wrote both in elegiacs and hexameters: in the former meter, the *Heroides*, the *Amores*, the *Ars Amatoria*, the *Tristia*, the *Ex Ponto*, and the *Fasti*; and in the latter, the *Metamorphosis*. He lacks the imagination, the passion, and the elevation of a great poet; his distinctive qualities are his facility, his apt choice of words, his smooth versification, and chiefly his power of storytelling, which made his works the favorite reading of the youth of both sexes in succeeding ages until the development of the modern novel. In prose there is but one outstanding name, that of Livy. Titus Livius (59 B.C. to 18 A.D.) was a native of Padua; his great work was a history of Rome from the earliest times to 9 B.C. It consisted of 142 books, and its composition occupied the historian for over forty years. His language marks the highest development of Latin prose; it is richer and more flexible than that of Cæsar, yet, though poetically colored, free from the innovations and eccentricities of later writers.

(3.) The Age of the Empire (25 to 524 A.D.).—For a quarter of a century or more from 20 or 25 A.D., literature appears to have been almost extinct at Rome. But for the next half-century or more after 50 A.D. Rome could show a succession of writers, both in poetry and in prose, not indeed—with the

possible exception of Tacitus—of first-rate genius, yet successful enough to win and deserve a lasting fame. Their period is called the Silver Age, as contrasted with the Golden or Augustan Age. The first of these is L. Annaeus Seneca (4 B.C. to 65 A.D.), the son of the rhetorician, and himself famous as a moralist. His moral writings are numerous, and contain much lofty thought and deep feeling, very rhetorically expressed. M. Annaeus Lucanus (39-65 A.D.) is remarkable for the production of his epic, the *Poarsalia*, at such an early age—he was executed for complicity in the Pisonian conspiracy against Nero at twenty-six—for the brilliance of his language, and the force of many of his statements. Another young poet, and a friend of Lucan, was Aulus Persius Flaccus (34-62 A.D.). His only work consists of six satires, amounting to over 600 lines of verse, marked chiefly by obscurity and acquaintance with books rather than mankind, but also by moral earnestness, delicacy of feeling, and a genuine delight in secluded study. Of the prose writers of this age, the elder Pliny comes first in point of date. Gaius Plinius Secundus (23-79 A.D.) was remarkable for his unwearying pursuit of knowledge. His works were numerous, including histories of Rome and of the wars on the Germanic frontiers; but only the thirty-seven books of his *Natural History* survive, which is a priceless collection of facts on every branch of natural science then known. Marcus Fabius Quintilianus (c. 35-95 A.D.) was much more of a literary artist; his life-work was the teaching of rhetoric, and his great achievement is his *Institutio Oratoria*, which is extant. Cornelius Tacitus (c. 55-120 A.D.) is really the last great figure of Latin literature, and the greatest of Roman historians. His works include the *Agricola*, a biography of his father-in-law; the *Germania*, a monograph on Germany; the *Annals* and the *Historics*, of each of which only parts survive; and an early work, *De Oratoribus*. The greatness of Tacitus as a historian consists not in his impartiality or true presentation of events but in his dramatic power and study of character, his moral elevation, and, above all, in the marvellous incisiveness of his style. Many of his phrases have become familiar quotations, and no writer could ever put more meaning into few words. His friend, Pliny the Younger—Gaius Plinius Cæcilius Secundus (61-105 A.D.)—though he plumes himself on his imitation of Tacitus, is merely a man of culture, not of genius; his *Letters* show much polish, but

are chiefly of value as a description of Roman society in his time. Gaius Suetonius Tranquillus (c. 75-160 A.D.) is the most important prose writer of the 2nd century; but his *Lives of the Twelve Cæsars* is only a collection of court gossip, valuable for its simplicity, its many anecdotes, and the interest of details about personages so universally famous as the early emperors of Rome. Juvenal—Decimus Junius Juvenalis—(c. 60-130 A.D.) is a somewhat earlier writer than those just mentioned, but his work may be fitly regarded as the close of original Roman literature. He was the last of the Roman satirists, and the most violent of them all. In his sixteen *Satires* he fully acts up to his own words, 'Indignation inspires my verse.' His satire is based on a thorough acquaintance with Roman life, especially with its seamy side. It is largely to him that the exaggerated belief in the corruption of Roman morals is due. After his time Latin writers cease to exhibit the real Roman character; nor is this remarkable, considering that many had already been, and in the future nearly all were, not Romans at all in nationality, but natives of every part of the empire. Indeed, towards the end of the 2nd century an entirely new Latin speech comes into being; literary Latin had long ceased to be a spoken language, though writers like Quintilian, Pliny the Younger, and Suetonius continued to use the vocabulary of the republican age. But the leading writers of the latter part of the 2nd century A.D. endeavored to return to the spoken language of their day. Their attempt failed, partly because the great classical writers had fixed the standard of Latin speech for all time, but perhaps more because none of them possessed the genius to do great work.

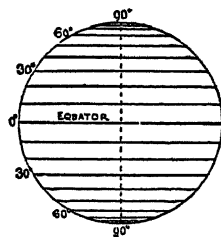
Finally, Boethius (c. 480-524 A.D.) stands at the parting of the ways between the ancient world and the middle ages. He was the last of the learned Romans who knew Greek, and in his philosophical works—mostly translations of and commentaries on Aristotle—he interpreted that philosopher to the Western world. His claim to rank among Latin authors depends on his *Philosophiæ Consolatio*. The teaching conveyed in it is a compendium of the loftiest moral teaching of antiquity. It was one of the earliest works to be translated into the modern language of Europe, and for centuries exercised a greater influence than perhaps any one secular work. After his time the Western empire was broken up into the kingdoms of France, Spain, Britain, and the

rest, and there ceased to be any unity in Latin literature.

For further information, see articles on CICERO, HORACE, LIVY, TACITUS, and others. See also Teuffel Schwabe's *Geschichte der Römischen Litteratur* (Eng. trans. by Warr, 1900); Schanz's *Geschichte der Römischen Litteratur bis zur Gesetzgebung des Kaisers Justinian* (1890-1901); Mackail's *Latin Literature* (1895); Tyrrell's *Latin Poetry* (1895); Sellar's *Poets of the Republic* (1889), *Poets of the Augustan Age* (1891), and *Horace and the Elegiac Poets* (1892); and Nettleship's *Essays in Latin Literature*, Series i. (1885), Series ii. (1896).

Latini, or **Latino**, **Brunetto** (c. 1212-94), Italian poet and scholar, was born at Florence. The work to which he mainly owed his contemporary fame is *Li Livres dou Trésor*, written in French (ed. by Chabaille, 1863), one of the many encyclopædies so popular in the middle ages. More important for literary history is the shorter *Tesoretto*, composed in Italian, which introduced the allegorical manner of the *Roman de la Rose* into Italy, and served Dante as a model in several ways.

Latinus, in ancient Roman legend, was king of Latium when Æneas landed there, and gave him his daughter Lavinia in marriage. See Virgil's *Æneid*.

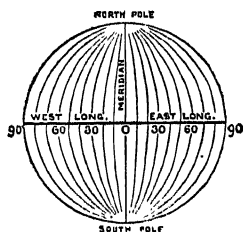


Parallels of Latitude.

Latitude and Longitude. Latitude is the distance of a place on the earth's surface north or south of the equator, measured in degrees, minutes, and seconds, the equator being represented by 0. In a degree of latitude there are sixty minutes, each possessing the value of a sea mile. The extremities of the earth's axis, the north and south poles, have a value of 90°. Latitude, otherwise expressed, is the angular distance of a place from the equator, measured on a meridian.

Longitude is the distance of any place on the globe's surface from another place, east-

ward or westward, or, more exactly, the distance of any place from a given meridian, being the arc of the equator intercepted between the meridian of that place and some other fixed meridian, the one from which longitude is reckoned being usually termed *the first meridian*. In the U. S. and Great Britain longitude is generally reckoned from the meridian of Greenwich. While in France the meridian passing through Paris is the starting point. Accordingly, the difference of longitude between two places is equivalent to the difference of the arc of the equator intercepted between their meridians.



Meridians of Longitude.

Latitudinarians, a party in the Church of England in the 17th century which strove to find a theological basis broad enough for men of different views to unite upon, and thus put an end to the embittered controversies of the time.

Latium, division of ancient Italy. The Latins, who were the earliest known inhabitants of this region, were members of the race which inhabited all the Mediterranean coasts. At an early date the Latin cities formed a confederation, the head of which was Alba Longa. Rome destroyed that city during the 7th century B. C. and afterwards became head of the Latin league. See **ROMÆ**.

Latour d'Auvergne, Théophile Malo Corret de (1743-1800), 'First Grenadier of the Armies of the Republic,' born in Finistère. When he died the whole French army mourned for him three days; his saber was placed in the church of the Invalides.

Latrobe, borough, Pennsylvania. It has large collieries and manufactures of steel, coke, paper, flour, lumber, glass, and bricks; p. 11,111.

Latrobe, Benjamin Henry (1764-1820), American architect, was born in Yorkshire, England. He had much to do with the plans and decoration of the Capitol at Washington, and was in charge of its rebuilding after its burning by the British in 1814. He was

the first to prove the suitability of the Breccia marble of the Potomac for decorative purposes.

Latter day Saints. See **Mormons**.

Lattice Leaf, Laceleaf, or Water Yam, a water plant, belonging to the order *Aponogetonaceæ*. The older leaves are of open structure, are nearly a foot long, oblong in shape, and float just below the surface of the water. The roots of the plant are used as food by the natives of Madagascar, where the plant is indigenous.

Latvia, former republic of Europe comprising the former Russian province of Courland, the four southern districts of the former Russian province of Livonia, and three western districts of the former Russian province of Vitebsk, with an area of about 25,000 sq. m. Agriculture is the leading industry, the principal crops being rye, barley, oats, flax, wheat, and potatoes. Fishing affords a livelihood to many of the inhabitants, and timber is exported. The principal industries are concerned with the preparation of food products, such as brewing, flour milling, the production of alcohol, the preparation of vegetable oils from linseed, and tobacco manufacture. The inhabitants are chiefly Letts or Latvians, mostly Protestants. Latvia is an independent republic with legislative power vested in the Saeima, which consists of 100 representatives elected for 3 years by universal, direct, and equal suffrage. It elects the President by an absolute majority and he holds office 3 yrs.

Latvia became a puppet state of Soviet Russia in Oct., 1939, when Stalin forced the government of the small nation to permit the Soviet to construct and maintain airports and quarter Red troops in Latvia.

Until 1560 the Lettish countries were united; in that year they were brought under Sweden, Lithuania, Poland, and Denmark, and after 1795 Latvia was under Russian rule. In 1918 it was proclaimed a free and independent state but again became a province of Russia, 1940; p. 1,929,000. It was occupied by German troops in July, 1941.

Laud, William (1572-1645), archbishop of Canterbury. Laud secured the confidence of Charles I., was one of his advisers and became dean of the Chapel Royal. From this time the religious policy of Charles I. was guided by Laud. Supported by the king, he compelled all the bishops to retire to their sees and introduced other reform measures. In 1633 he was appointed archbishop of Canterbury. The opening of the Long Parliament in 1640 was shortly followed by the impris-

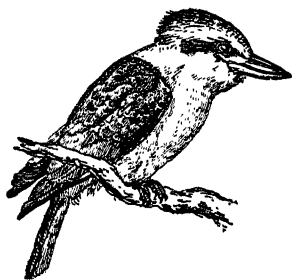
onment of Laud and Strafford. A bill of attainder was passed against him 1645, and a few days later he was beheaded.

Lauda, the name given to early Italian religious and spiritual songs, dating from the 13th century.

Laudanum, or **Tincture of Opium**, is an alcoholic extract, prepared by rubbing opium up with water, adding alcohol, straining off the liquid portion, and diluting to the desired strength. It is a brown-colored liquid, valuable medicinally on account of the morphine present. See **OPRUM**.

Lauder, Sir Harry (1870-), Scottish comedian, whose real name was MacLennan. He worked as a mill boy in a flax-spinning plant, and later as a miner. He managed to acquire some knowledge of music, and using this along with his natural talent for humorous entertainment, he made his stage *début* in Arbroath. Meeting with marked success, he made repeated tours of Scotland and Ireland, becoming famous for his Scotch songs and characterizations.

Laughing Gas. See **Nitrogen**.



Laughing Jackass.

Laughing Jackass, or **Settler's Clock** (*Dacelo gigas*), a very large kingfisher found in Australia, where it receives its popular names from the peculiar gurgling cry uttered with great regularity at dawn and dusk.

Laughlin, James Lawrence (1850-1933), American economist, was born at Deerfield, O. He devoted much attention to the study of money and the currency, and prepared reports on these subjects for foreign and state governments.

Laughton, Charles (1899-), English stage and screen actor. In 1926 he made his debut on the London stage. In 1931 he made his first appearance in N. Y. in *The Fatal Alibi*. Thereafter he went to Hollywood and made several pictures including *The Sign of the Cross*, *The Barretts of Wimpole Street*,

Mutiny on the Bounty, *It Started with Eve*. It was in the English picture, *The Private Life of Henry VIII* that he scored his greatest success, and for which he received the award of the Academy of Motion Picture Arts and Sciences in 1933 for the outstanding male characterization of the year. His wife is Elsa Lanchester.

Launceston. Principal town of the N. of Tasmania, Commonwealth of Australia. It is the commercial, official, and judicial capital of the north, and its commerce is larger than that of Hobart; p. 29,200.

Laundries, Modern Steam. In no two laundries is the washing process alike, although it consists mainly of three steps, washing, rinsing, and blueing. Washing consists of revolving the goods in a solution of soda and soap at a boiling temperature for some minutes. Rinsing consists of the same process in clear water, either warm or cold, generally three or four times. The last rinse being tinted with aniline blue is known as the blueing process. After the various rinsing and blueing processes which follow, the washer is stopped, the door opened, and the goods removed to the extractor or wringer.

In American steam laundries, the clothes line is unknown, the clothes being dried in dry rooms or drying cabinets heated by steam coils. These owe their efficiency to the water-absorbing power of heated air, and the immediate removal of this moisture-laden air by means of exhaust fans. For shirts there are starchers in which the bosom is immersed in the solution between rollers which work the starch in. After the goods come from the dry room they are dampened, preparatory to the ironing process. There is possibly no other process in modern laundries in which so many different and distinct machines are used as in that of ironing.

La Unión, province, Luzon, Philippines, in the northern part of the island, on the west coast. The coast line is 45 m. long, the southern half forming the shore of the Gulf of Lingayen. The country is mountainous and has many streams. The soil is fertile, the climate moist. The river sands contain low-grade good, and there is much valuable timber in the forests. Tobacco, rice, corn, cotton, sugar cane, and chocolate are important crops; the valuable dye plant sibucao is gathered in the interior. Stock raising is one of the principal industries. San Fernando is the capital.

Lauraceæ, a natural order of herbs, shrubs, and trees, mainly tropical in habitat, and mostly possessing marked aromatic proper-

ties. They bear evergreen, coriaceous leaves and small greenish flowers. Among the genera are *Laurus*, *Cinnamomum*, *Camphora*, and *Sassafras*.

Laureate. See **Poet Laureate.**

Laurel, the popular name in America for the beautiful though poisonous *Kalmia*, but properly belonging to the wellknown evergreen shrub called the Sweet Bay Tree, of the genus *Laurus*. The latter is distinguished by long, lanceolate, shiny leaves, and by a characteristic aroma yielded by all parts of the plant when crushed. In early spring it bears small yellowish flowers, and these are followed by dark purple berries in autumn. In ancient times these fruiting twigs were woven into the laurel wreaths with which victorious poets and heroes were crowned.

Laurens, Henry (1724-92), American patriot, was born in Charleston, S. C. During the American Revolution he was a prominent Whig or Patriot leader in South Carolina; was president of the South Carolina Committee of Safety; and was a member of the Continental Congress (1777-80), of which he was also president (November, 1777, to December, 1778). He was sent to Holland in 1780 to negotiate a loan, but was captured by a British vessel *en route*; and in 1780-81 he was imprisoned in the Tower, London. Subsequently he was one of the American peace commissioners in Paris, and signed the preliminary treaty (November, 1782). Among the papers taken when he was captured in 1780 was a proposed treaty between Congress and Amsterdam, which served as a pretext for England's declaration of war against Holland.

Laurens, John (1754-82), American soldier, the son of Henry Laurens, was born in Charleston, S. C. In 1781, as a special commissioner from the United States, he secured a loan from the French government, opportunely reaching Boston with clothing, ammunition, and half a million dollars in cash, on Aug. 25, just as Washington was starting with his army for Yorktown. As a soldier he was conspicuous for his daring. His personal qualities won him the title, 'The Bayard of the American Revolution.'

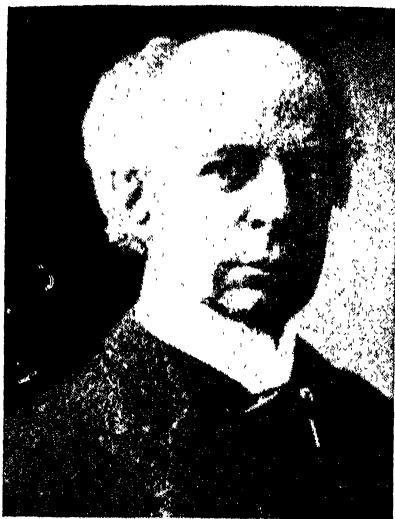
Laurent, Auguste (1807-53), French chemist, is notable for his work leading to a clearer understanding of the constitution of organic compounds.

Laurentian System. See **Archæan System.**

Laurentum, ancient capital of Latium, Italy, near the coast, 16 m. s.w. of Rome. Its

name is said to be derived from the surrounding laurel groves, which formed an attraction for wealthy Romans.

Laurier, Wilfrid (1841-1910), Canadian, statesman, was born in St. Lin, Province of Quebec, Nov. 20, 1841. He was educated at L'Assomption College and at McGill University; studied law, and was called to the bar in 1864. In 1877 he entered the Liberal Mackenzie government as Minister of Inland Revenue. The Conservative victory of 1878 placed his party in opposition for eighteen years, during which time he was a loyal lieutenant to the Liberal leaders, first Mackenzie, and later Edward Blake.



Sir Wilfrid Laurier.

Although a French-Canadian, and thus presumably lacking in vigorous support from the English-speaking provinces, Sir Wilfrid assumed the leadership of the Liberal Party in 1887, after Blake had resigned owing to differences with his party on the subject of unrestricted reciprocity with the United States. In 1896 Laurier became Prime Minister of Canada, the first French-Canadian to hold that high office. His government was sustained at the general elections of 1900, 1904, and 1908. In the elections of September, 1911, the Laurier ministry was defeated, mainly on the issue of reciprocity with the United States. The Union government was overwhelmingly sustained in the elections of 1917, and Laurier continued as leader of the opposition until his death on February 17, 1919.

Lauriston, Jacques Alexander Bernard

Law, Marquis de (1768-1828), French general, was born in Pondicherry, India. He was associated with Napoleon in his military operations. When the Empire fell he tendered his allegiance to Louis XVIII.; remained faithful to him during the Hundred Days, and as a reward was made a peer of France.

Laurium (Greek *Laureion*), mountain at the extreme s. end of Attica, in ancient Greece.

Laurium, village, Houghton Co., Michigan. It contains one of the richest copper mines (Calumet and Hecla) in the world, yielding from 10,000 to 20,000 tons annually; p. 3,929.

Laurustinus (*Viburnum tinus*), an evergreen shrub, a native of Southern Europe and Northern Africa, but very hardy in almost any climate. It belongs to the honeysuckle family.

Laurvik, or **Larvik**, seaport town and spa, with mineral springs and mud baths, Jarlsberg-Laurvik province, Norway, at the head of the fiord of the same name.

Lausanne, town, capital of canton Vaud, Switzerland, is built on the slopes of the Jorat range, half a m. from Ouchy, its port, on the n. shore of the Lake of Geneva. Lausanne is the seat of the federal court of justice. It is on the Simplon Tunnel route between Paris and Milan. Voltaire, Haller, Tissot, and Byron resided here, and here Gibbon wrote the latter half of his *Decline and Fall of the Roman Empire*. Lausanne is the see of a Roman Catholic bishop.

Lauterbach, Edward (1844-1923), American lawyer, born in New York City. He was graduated from the College of the City of New York in 1864 (A.M., 1867); was admitted to the bar in 1866; became a member of the law firm of Hoadly, Lauterbach, & Johnson, and gained prominence as a railroad organizer. For several years he was chairman of the Republican County Committee of New York, and in 1896 was delegate-at-large to the National Convention. He was prominent in many public activities and charities; was chairman of the board of trustees of the College of the City of New York, and was for seven years a member of the State Board of Regents.

Lauterbrunnen, tourist resort in the Bernese Oberland, Switzerland, 6 m. s.e. of Interlaken, in the deep and picturesque valley of the White Lütschine. It has numerous springs and waterfalls.

Lava, molten rock erupted by volcanoes or poured out through fissures in the earth's surface. The temperature of lava at the moment of eruption probably ranges from 1200° to 2000° C., and in some cases its liquidity is so great that the molten rock forms a

fountain rising in the air. Basic lavas are usually darker than those of the acid type, and when in a state of fusion tend to flow to great distance; while acid lavas are more viscous, and quickly congeal after extrusion.

La Vallière, Françoise, Louise de La baume de Blanc, Duchess de (1644-1710), mistress of Louis XIV., was born in Tours, of old and honorable descent.

Laval-Montmorency, François Xavier de (1622-1708), French-Canadian pioneer, was born in Laval, France. In 1659 he was sent to Canada as vicar of the Pope, where in 1663 he established the Seminary of Quebec. From 1674 to 1683 he was titular bishop of Quebec. He afterward resigned, and devoted himself to the advancement of the seminary.

Laval, Pierre (1883-), French politician, self-educated son of an impoverished baker of Chateldon, in the Auvergne, as Foreign Minister in the Flandin Cabinet (1935) met the challenge of Germany's rearmament by forming a close alliance with Italy, strengthening the ties with England and achieving a Franco-Russian rapprochement. He visited the U. S. in 1931. In 1940 he cast his fortunes with the Nazis, becoming Vice-Premier of Pétain's Vichy government. April 14, 1942, he assumed the premiership. After the Allied victory he fled to Spain; was soon returned. In 1945 he was put on trial by a French court, was convicted for intelligence with the enemy and acts against the security of France, was condemned to death and executed by a firing squad, Oct. 15.

Laval University, a Roman Catholic institution situated in Quebec, Canada, with faculties of theology, law, medicine, and arts.

Lavedan, Henri Leon Emile (1859-1940), French dramatist, was born in Orleans. He contributed to several Parisian newspapers a series of witty stories of Parisian life.

Lavelle, Michael J. (1856-1939), Roman Catholic prelate, was born in N. Y. City. He was graduated from Manhattan College, and from St. Joseph's Seminary; was ordained to the priesthood in 1879; and was assistant at St. Patrick's Cathedral till 1886, when he became rector. In 1902 he was appointed vicar-general of New York, and in 1903 was made a domestic prelate by Pope Pius x.

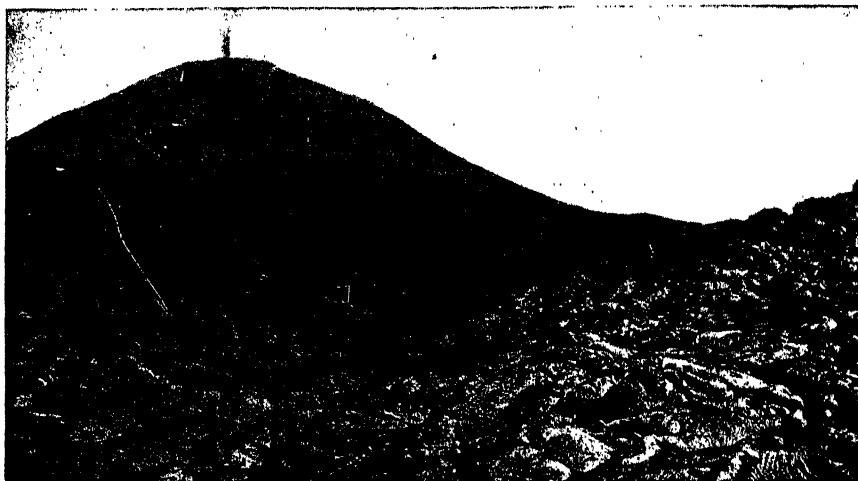
Lavender (*Lavandula vera*), a hardy perennial herbaceous shrub belonging to the mint family, valued for its fragrant flowers, which retain their odor for a long period if carefully gathered. *Oil of Lavender* is obtained by distillation of the flowers.

Lavender Water is made by mixing together a pint of rectified spirit, four ounces of distilled water, three drachms of oil of lavender, three drachms of orange-flower water, five minims each of oil of cloves and oil of cinnamon, and four minims of otto of roses. Allow this mixture to stand for a fortnight, then filter through magnesium carbonate, and bottle. It should be kept for at least three months before using.

Laver, a brazen vessel in the Hebrew Tabernacle, in which the priests cleansed their hands and feet in preparation for the sacrifices.

La Villemarqué, Théodore Claude Henri Hersart, Vicomte de (1815-95), Celtic archæologist and philologist, was born in Quimperlé, and studied at Paris. His *Barzaz-Breiz* (1839; Eng. trans.) was the outcome of long-continued research.

Lavisse, Ernest (1842-1922), French historian, born Nouvion-en-Thiérache. He became professor of modern history at the Sorbonne (1888), and a member of the Academy (1892). During the time of the Second Empire he was a member of the Duruy Cabinet, and was tutor of the Prince Imperial. After the Franco-Prussian War he applied himself



Lava Flow on Mount Vesuvius.

Laver, a name given to various seaweeds belonging to the genera *Ulva* and *Porphyra*, occurring on certain European coasts. They are used for food after being well boiled.

Laveran, Charles Louis Alphonse (1845-1922), French scientist, born in Paris. From 1878 to 1883 he devoted his time to the study of malaria, in the interest primarily of military hygiene, discovering the hæmatozoön of malaria in Algeria (1880), and demonstrating in Italy (1882) that malaria is spread by mosquitoes. He was elected to the Academy of Sciences in 1901, and awarded the Nobel Prize for Medicine in 1907.

Lavery, John (1857-1941), British portrait painter, born Belfast. His *Tennis Party* (Munich Pinakotek) was exhibited in the Royal Academy in 1887, and *The Visit of Queen Victoria to the Glasgow Exhibition* (Glasgow Gallery) in 1888.

to the study of the causes and development of the strength of the German Empire, and some of his chief works are on the history of Germany.

Lavoisier, Antoine Laurent (1743-94), French chemist, was born in Paris. He studied chemistry under Rouelle. He early devoted his attention to research, and at the age of 25 was elected a member of the Académie des Sciences. His principal work was in developing the true explanation of the phenomena of calcination and burning, and he formulated the theory of the conservation of mass, upon which all modern chemistry rests.

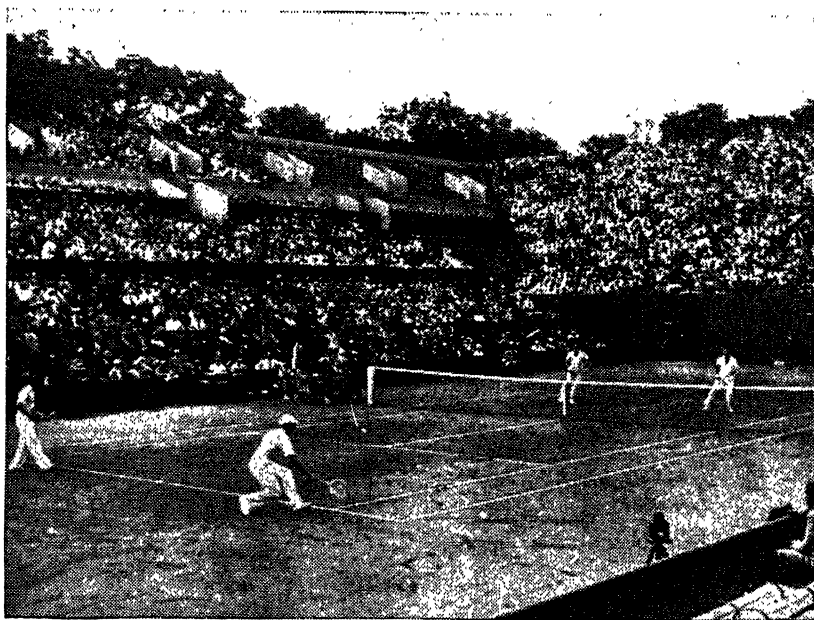
Law. Specifically, in jurisprudence, the general code of rules for action is habitually enforced by the authority of the state. The term is also used in a great variety of other significations, some by analogy resembling more or less closely the 'positive law' above defined,

others only in a metaphorical sense. To the former class belong such expressions as the 'law of God,' the 'moral law,' the 'laws of honor,' the 'laws of good society,' and the like. To the latter may be referred its use in the phrase 'the law of nature,' which denotes the ascertained order of natural events as shown in a constant course of procedure.

The importance of law arises from the fact that in a developed society it is the chief, if not the only means by which justice can be administered, and justice is the chief concern of the state. Every 'common law' system is, in

thoroughly and exactly the conditions of any such uniformity of sequence or coexistence are ascertained, the more certain and scientific does the generalization or law become; while, so far as the uniformity is merely affirmed as a fact of experience without its conditions being determined, the generalization—termed in that case an 'empirical law'—is of inferior scientific value.

Law, Right Hon. Andrew Bonar (1858-1923), British statesman, born in New Brunswick, Canada. He was educated in New Brunswick, and later at the High School in Glas-



Lawn Tennis.

Davis Cup Doubles at Auteuil, France.

its origin, a body of customary rules which are defined and, in course of time, modified and developed by the courts.

From the point of view of its administration, law is divided into two classes—substantive, and adjective, or remedial; the former comprising the rules which define the rights protected by law; and the latter the rules providing the means by which such rights are protected, including the organization, jurisdiction, and procedure of the courts.

Law (scientific). By a 'law' in the natural and social sciences is meant a generalized statement regarding the connection of phenomena by way of co-existence or sequence. The more

gorow, Scotland. From 1902 to 1906 he was Parliamentary Secretary of the Board of Trade. In November, 1911, he was chosen leader of the Unionist Party in the House of Commons, to fill the vacancy caused by the resignation of Arthur J. Balfour, which position he held until 1915. In October, 1922, he was chosen Premier and First Lord of the Treasury to succeed Lloyd-George, heading the first Conservative government in power for 17 years. He was a member of the War Council and represented Great Britain at the Peace Conference in Paris.

Law, John, 'of Lauriston' (1671-1729), originator of the Mississippi Scheme, was born

in Edinburgh. After a duel in which he killed his adversary, he fled to the Continent in 1695, and later settled in Paris. Here he began a private bank (1716), and in 1718 induced the Regent Orleans to adopt his suggestion for a national bank. His scheme for settling lands in the Mississippi Valley was started in 1717. A company was formed, and the wild speculations in its stock brought widespread ruin and disaster when the bubble burst.

Law, William (1686-1761), English divine. His most notable works: *Practical Treatise on Christian Perfection* (1726), and *A Serious Call to a Devout and Holy Life* (1729).

Lawler, John J. (1862-), American Roman Catholic bishop, was born in Rochester, Minn. He was ordained to the priesthood in 1885. He became pastor of St. Luke's Church, St. Paul, and later pastor of the Cathedral. In 1910 he was appointed auxiliary bishop of the archdiocese, and in 1916 bishop of Lead, S. D.

Law, Merchant, an ancient body of mercantile law, common to the nations of Western Europe in the Middle Ages, and originally administered by separate tribunals in the principal ports, which has in the course of centuries become a part of the municipal law of the several countries in which it flourished, as well as of the United States.

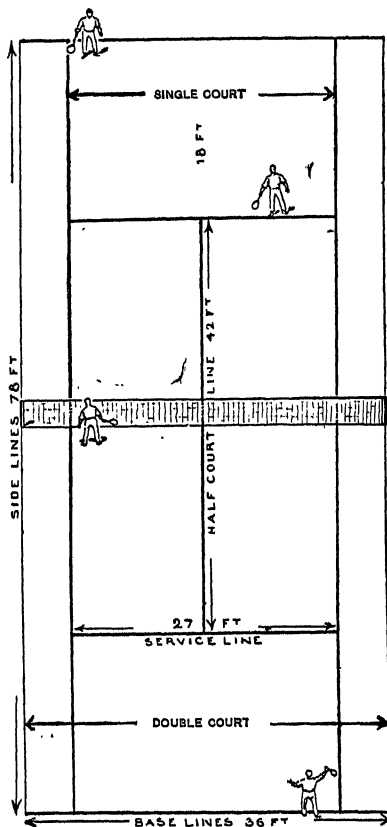
Lawn Mowers consist essentially of a broad, horizontal blade, edged in front, and adjustable to move more or less close to the ground.

Lawns (Grass) require great care in their preparation and maintenance. As the lawn is the foundation for all gardening effects, grading is of prime importance. A new lawn should be prepared a year in advance, if possible, by growing on it a crop of clover (cowpeas in the South), and ploughing under. In the Northern United States, Kentucky bluegrass, Canadian bluegrass, creeping bent, and Rhode Island bent grasses are among the best for lawn-making purposes. In the Southern United States, Bermuda or St. Augustine grass makes the best lawns.

Lawn Tennis, the popular form of tennis, is the modern development of the old French game of court tennis (see TENNIS). It is essentially an outdoor game, played with balls and rackets on firm grass lawns or on hard dirt courts, but it may be played indoors as well.

In the United States, Dr. James Dwight and the Sears brothers may be called the pio-

neers, as they laid out the first lawn tennis court at Nahant, Mass., in 1874. The first tournament in America was held at Nahant in 1876. The game was played in many places under varying rules until 1881, when the U. S. National Lawn Tennis Association was formed, with a membership of 33 clubs. The rules formulated by the national association now govern the game.



Lawn Tennis Court.

Method of Play.—The rackets used vary in size and weight, 14 ounces being about the medium weight. The balls are of inflated India rubber, covered with white cloth.

The *single-handed game* is played by two persons in a single court. For this game the court is 27 feet wide and 78 feet long, divided across the middle by a net attached to posts which stand 3 feet outside the courts on each side. The net is 3 feet 6 inches high at the posts, and 3 feet high at its center. At each

end of the court, parallel with the net, and 39 ft. from it, are drawn the base lines, the ends of which are connected by the side lines. On each side of the net, at a distance of 21 feet from it, and parallel with it, are drawn the service lines. The middle points of the service lines are joined by the center service line, dividing the space on each side of the net between the service line and the side lines into two service courts.

The *four-handed game* is played by two persons on each side in a double court ($4\frac{1}{2}$ ft. wider on each side than the single court), in a manner similar to the single-handed game. In the service the ball must drop in the rectangle bounded by the service, service-side, and half-court lines.

with the regulations of the U. S. Lawn Tennis Association.

The Davis Cup.—This cup, presented to the American Association by Dwight L. Davis in 1900 for international competition, has undoubtedly done much to popularize and stimulate interest in tennis. The competing teams may consist of from two to five players, who play five matches (four singles and one doubles). The final matches are played in the country of the team holding the cup. The Great War caused a five-year interruption of the international contests but they were resumed in 1919. The United States won the Davis Cup two successive years, 1937-38.

Professional Tennis.—In 1926 an attempt was made to get the best of the amateur

U. S. Tennis Champions.

Year	Men-Singles	Men-Doubles	Women-Singles	Women-Doubles
1935	W. Allison	W. Allison J. Van Ryn	H. Jacobs	H. Jacobs S. Palfrey Fabyan
1936	F. J. Perry	J. D. Budge G. Mako	A. Marble	C. Babcock Mrs. J. Van Ryn
1937	J. D. Budge	H. Henkle G. Von Cramm	A. Lizana	A. Marble S. P. Fabyan
1938	J. D. Budge	J. D. Budge C. G. Mako	A. Marble	A. Marble S. P. Fabyan
1939	R. Riggs	A. Quist J. Bromwich	A. Marble	A. Marble S. P. Fabyan
1940	D. McNeill	J. A. Kramer F. R. Schroeder, Jr.	A. Marble	A. Marble S. P. Fabyan
1941	R. Riggs	J. A. Kramer F. R. Schroeder, Jr.	E. T. Cooke	E. T. Cooke M. Osborne
1942	F. R. Schroeder, Jr.	Lt. G. Mulloy W. Talbert	P. Betz	A. L. Brough M. Osborne

Method of Scoring.—On either player winning his first stroke, the score is called 15 for that player; on winning his second stroke, 30; on winning his third stroke, 40; and the fourth stroke is scored game, except as follows: If both players have won 3 strokes, the score is called 'deuce,' and the next stroke won by either player is scored 'vantage in' for that player. If the same player wins the next stroke, he wins the game; if he lose the next stroke, it is again called deuce; and so on until either player wins the two strokes immediately following the score of deuce. The term 'love' is used to indicate no score. The player who first wins six games wins a set, except if each player wins five; in that case, deuce and vantage sets are played, the same as in games.

Tournaments.—In the United States tennis tournaments are conducted in accordance

tennis players to turn professional, and Miss Suzanne Lenglen, one of the finest women players, gave up her amateur status and toured the country in a series of matches. The professional game received its greatest impetus, however, when William T. Tilden joined the professional ranks in 1931. In 1933 H. Ellsworth Vines turned professional, and in 1937 Frederick J. Perry made his professional debut. After winning all the major championships in 1938, J. Donald Budge turned professional at end of the season.

Law Officers. In the United States the term law officer is used loosely to include any legal representative of the people, whether elective or appointive, such as the Attorney-General and assistant attorneys-general of the United States and the several States, the Solicitor General of the United States, the solicitor of the State Department at Washington.

U. S. district attorneys, and in general the attorneys of municipal corporations and prosecuting attorneys in the several counties throughout the United States.

Lawrence, city, Massachusetts, one of the county seats of Essex co., on the Merrimac River. Lawrence has one of the largest worsted mills in the world, and the largest cloth printing works in the United States; p. 84,-323.

Lawrence, city, Kans., co. seat of Douglas co., on the Kansas River. Lawrence was the headquarters of the abolitionists in Kansas; p. 14,390.

Lawrence, Abbott (1792-1855), American merchant, legislator, and diplomat, brother of Amos Lawrence, was born in Groton, Mass. He was United States' commissioner for the settlement of the Northeastern boundary question with Great Britain, 1842, and minister to Great Britain, 1849-52. He made many contributions to educational institutions.

Lawrence, Amos (1786-1852), American merchant, was born in Groton, Mass. He and his brother Abbott were instrumental in developing the manufacture of cotton goods in the United States, and started a factory at Lowell, Mass., 1830.

Lawrence, David Herbert (1885-1930), British novelist. His work is marked by a psychoanalytical trend. Among his later publications are *England, My England!* (1924); *The Plumed Serpent* (1926); *Collected Poems* (1928). His most widely read books were *Lady Chatterly's Lover* and *Sons and Lovers*. His *Letters* were edited by Huxley.

Lawrence, Ernest Orlando (1901-), U. S. scientist; b. in Canton, S. D. He was educated at St. Olaf's College, Univ. of S. D., Univ. of Minn., Univ. of Chicago, and Yale. He has been a professor at Univ. of Cal., since 1928. In 1937 he was awarded the Comstock prize of the National Academy of Science and in 1939 the Nobel prize for his invention of the cyclotron, an atom-smashing machine.

Lawrence, James (1781-1813), American naval officer, was born in Burlington, N. J. He distinguished himself in the war with Tripoli. He was promoted captain, 1811, and in the War of 1812 sank the *Peacock* off Demerara, while in command of the *Hornet*. He was placed in command of the frigate *Chesapeake* at Boston harbor, and being challenged by Captain Broke of the *Shannon*, went out with a new crew and fought an unsuccessful battle (June 1, 1813), his ship being taken after he himself had been shot

down. His cry while being carried below, 'Don't give up the ship,' has become a classic.

Lawrence, John (1750-1810), American statesman, was born in Cornwall, England. He went to New York, 1767, where he practised law until the Revolutionary War. He served several terms in Congress, and was a United States senator, 1796-1800.

Lawrence, John Laird Mair, Lord (1811-79), British officer and administrator. In 1863 he became governor general of India.

Lawrence, Thomas Edward, also known as **T. E. Shaw** (1888-1935), British explorer, author and scholar. During the War he united practically all the tribes between Mecca and Aleppo. In 1918 he entered Damascus some hours ahead of the British forces, holding the city until General Allenby arrived. He took part in the Peace Conference, but being unable to prevail against France's plans in Syria he retired to devote himself to writing his experiences. His book, *Revolt in the Desert* (1927) tells the story of his experiences. He was killed in a motorcycle accident in 1935.

Lawrence, Sir Thomas (1769-1830), English portrait painter. His portrait of Elizabeth Farren, Countess of Derby, now in the Morgan collection, New York City, established his reputation. He was appointed his Majesty's painter (1792). When he received full academical honors (1795), he was already without a rival in public estimation. On the death of West (1820) he was elected president of the Royal Academy.

Lawrence, William (1819-99), American jurist, was born in Ohio. From 1880 to 1885 he was comptroller of the currency.

Lawrence, William (1850-1941), American bishop, grandson of Amos Lawrence. In 1893 he was consecrated bishop of Massachusetts, retiring from active service in 1927.

Lawrence, William Beach (1800-81), American jurist, was born in New York City. He was admitted to the bar of New York, 1823. Removing to Newport, in 1850, he was elected lieutenant governor of Rhode Island, 1851, soon succeeding as acting governor.

Lawrence College, coeducational institution affiliated with the Methodist Episcopal Church at Appleton, Wis.

Lawrence, St. (d. 258), Christian martyr, one of the deacons at Rome under Sixtus I. During the persecution of Valerian he was called upon to surrender the church treasures but instead he produced the poor and sick under his charge, declaring that these 'were his treasures.' His day is August 10.

Lawson, Cecil Gordon (1851-82), English landscape painter. Paintings by him are in the Manchester, Liverpool, and Tate Galleries.

Lawson, John (?-1712), American historian, was born in Scotland, and sailed to America from Cowes, England, landing at Charleston, S. C., in 1700. He travelled extensively among the Indians of North and South Carolina, and became surveyor general of the former colony, serving for 12 years.

Lawson, Thomas William (1855-1925), American financier, was born in Charlestown, Mass. He received a public school education and began business as a banker and broker in 1870, and, while residing in Boston, took an active part in New York financial affairs, also acquiring a large fortune. He became a frequent contributor to periodicals, and published *Frenzied Finance* (1905), *Friday the Thirteenth* (1907), *High Cost of Living* (1913).

Lawsonia, a genus of plants belonging to the order Lythraceæ, containing only one species, *L. alba*, the henna plant. This is a tropical shrub, from whose fragrant white flowers is prepared the alhenna used in Arabia and other Eastern countries for coloring the nails, finger tips and other parts of the hand, imparting to them a reddish orange shade.

Lawyer, the popular term for a member of the legal profession. Specifically a lawyer is a person who has been trained in the principles and practice of the law of the land and licensed by the state or under its authority to conduct legal proceedings for others. Every developed system of law calls for a body of trained experts to administer it and to advise others as to their rights and duties thereunder, who, owing to their association with each other in the conduct of legal business and their common relation to the courts, tend to become an exclusive profession, admission to which is guarded and regulated by themselves.

In the United States there is some diversity of opinion as to whether the regulation of admissions to the bar is a function of the courts or the legislature, but in practice the matter is usually left to the courts, subject to general legislative control. In the United States all members of the legal profession, however specialized their work (as trial lawyers, office lawyers, patent lawyers, etc.) are of equal dignity and entitled by law to practise in the same courts.

Layamon (fl. 1200), author of *Brut*, a poetical paraphrase of Wace's chronicle, *Brut d'Angleterre* (1155), with additions of his

own. Layamon's *Brut* exists in two mss., both in the British Museum.

Layard, Sir Austen Henry (1817-94), English traveller and archæologist, was born in Paris. He was impressed by the ruin-mounds of Nimrud, at Nineveh, and began excavations (1845). In that and the two following years he made many discoveries, finding traces of four distinct palaces, and unearthing the colossal human-headed bulls now in the British Museum, and numerous bas-reliefs and cuneiform inscriptions. He was under-secretary for foreign affairs (1852 and 1861-66), chief commissioner of works (1868-9), ambassador at Madrid (1869-77), and ambassador at Constantinople (1877-80).

Layering, a method of plant propagation by which a part of the plant is bent down and covered with soil, so that it may emit roots before being separated from the parent plant.

Laying On of Hands, a religious rite both Christian and Jewish. In the Old Testament it was used in connection with the burnt offering, the peace offering, the sin offering, the setting apart of priests and the punishment of idolatry. In all these cases it meant the marking out of a special destiny for a certain object, or else the transmission of an office, a sin, or a blessing.

In the New Testament Christ often performed his blessings and his miracles of healing by the laying on of hands, which is merely symbolic of the will to heal. In the Roman Catholic and the Protestant Episcopal Churches, for confirmation and ordination, and in various other Protestant bodies, for ordination, the custom of the laying on of hands has been retained.

Lay Reader, a layman whose office it is to read all lessons in church, including even the gospel. Lay readers are allowed, under certain circumstances, to read the prayers, and to preach, and otherwise to perform all ministerial functions which are not peculiar to those who have received holy orders.

Lazaretto (from *lazar*, 'a leper'), a word used in two distinct senses. (1.) A hospital for sick poor, especially lepers. (2.) A place for the performance of quarantine.

Lazarists, or more correctly **Congregation of the Priests of the Mission**, a Roman Catholic order of priests founded by Saint Vincent de Paul in 1624. It was confirmed by a bull of Urban VIII. in 1632 and in that same year the house of St. Lazarus in Paris was established. The main object of the Lazarists was the teaching, care and relief

of the poor by means of missions in both towns and cities. The French congregation suffered severely during the Revolution. The order soon spread to all parts of the world and now numbers about 35,000 actively engaged in mission work.

Lazarus, the name given to two different characters in the New Testament. One was a beloved friend of Jesus, the brother of Mary and Martha, whom Jesus raised from the dead. The other is the beggar in the parable of the rich man and the beggar.

Lazarus, Emma (1849-87), American poet, was born in New York City, of Jewish parentage. She took an active interest in relieving the necessities of those of her race who were driven from Russia to the United States in 1882. A collective edition of her *Poems, Narrative, Dramatic, and Lyric*, was published in 1888.

Lazzaroni, until lately a special class of the inhabitants of Naples. They had no regular occupation, but occasionally obtained employment as messengers, porters, boatmen, etc.

Lea, Homer (1876-1912), American soldier and writer, became a general in the Chinese army and military adviser to Sun Yat-sen. Before World War I he wrote two books that predicted the coming fight for world power. See *The Valor of Ignorance* and *The Day of the Saxon* (new eds. 1942).

Leacock, Stephen Butler (1869-1944), Canadian humorist and professor of economics at McGill University, Montreal. He wrote *Nonsense Novels; Literary Lapses; Frenzied Fiction; The British Empire; Happy Stories Just to Laugh at*.

Lead, city, Lawrence co., South Dakota. It is situated in the famous gold-mining region of the Black Hills; p. 7,520.

Lead (Pb, 207.1), a metallic element known from early times, and occurring in various ores widely distributed over the world. The principal ore, and the one from which the great bulk of the world's supply is derived, is galena (PbS), a more or less argentiferous sulphide containing 86.6 per cent. of lead. Others of less economic importance are anglesite (PbSO₄) and cerussite (PbCO₃).

Three general processes of extracting lead from its ores are employed, either separately or in combination. They are roast reaction, roast reduction, and precipitation.

The *Roast-Reaction* or *Air-Reduction Process* is especially adapted to high-grade, non-argentiferous galenas.

The *Roast-Reduction Method* comprises two operations: a preliminary roasting pro-

cess, and a subsequent smelting in the blast furnace, which reduces the metal, and slags the impurities, so that a separation may be effected.

The *Precipitation Process* for the production of metallic lead from galena by the action of metallic iron is seldom used in its entirety in the United States.

Several *Electrolytic Processes* of refining have been devised. In that of A. G. Betts the anodes are of softened argentiferous lead, the cathodes of thin sheets of pure lead, and the electrolyte fluid of lead fluosilicate. On passing a current of electricity through this series, lead is dissolved from the anode and deposited on the cathode, leaving the silver and other impurities in the form of a mud; the cathodes of pure metal are washed, melted, and cast into pigs.

Metallic lead is of a bluish white color tending to gray, and having a bright metallic lustre. In its pure state it is very soft, highly malleable, in a less degree ductile, and its tenacity is slight. Its specific gravity is between 11.25 and 11.39, atomic weight 207.1; it melts at 328° C., and is a poor conductor of electricity. In pure dry air it remains unaltered; but exposed to the joint action of air and moisture it becomes rapidly tarnished.

Metallic lead is marketed in three main forms: *soft* lead, derived from non-argentiferous ores, *desilverized* lead, and *hard* or *antimonial* lead. Soft and desilverized lead finds its chief applications in the manufacture of lead pipe, extensively employed in plumbing and in chemical works; sheet lead, used as a lining for vessels for containing acids and other corrosive solutions; and bullets and shot. It is also used in the manufacture of white lead, as well as in the preparation of certain alloys, including solder and pewter. Antimonial lead is employed for making type metal, stereotype metal, and similar alloys.

Lead ores are to be found all over the world, and lead smelting is carried on in nearly every country. The United States is the greatest producer, furnishing almost one-third of the world's supply. Spain ranks second, Germany third, and Australia fourth. The Rocky Mountain and Pacific Slope section, comprising Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, and Utah, supplies the major part of the lead produced in the United States.

Lead, The, an instrument used by seamen to ascertain the depth of water. It is almost invariably of prismatic shape, octagonal or hexagonal in section, tapers slightly from base

to top, and its length is six or eight times its diameter. At the upper end there is an eye for the end of the lead line, and in the lower a recess for the 'arming' of tallow. When the lead is cast the depth of water is ascertained by observing which mark of the line is at or near the surface when the lead is on the bottom, and the character of the latter is shown by the particles of sand, shells, etc., adhering to the tallow. Sounding machines have largely supplanted the lead in modern navigation.

Lead Glance. See *Galena*.

Lead Plaster, or Diachylon Plaster, consists chiefly of lead oleate, $(C_{17}H_{35}COO)_2Pb$, and glycerin, and is prepared by boiling litharge (PbO) with water and olive oil. It is used as the basis of many plasters employed in medicine.

Leadville, city, Colorado, co. seat of Lake co. It is situated in a rich silver and lead mining region, at an altitude of 10,200 ft.; has large smelting furnaces and reduction works, and a large output of silver; p. 4,774.

Leaf, one of the nutritive organs of a plant, arising from the stem, or a shoot, below the growing point, at certain intervals called nodes, the spaces between being termed internodes. In the leaves of monocotyledons the venation is for the most part parallel, while in those of the dicotyledons it forms a network. The expanded portion is the lamina or blade, normally attached to the axis by a stalk or petiole, at the base of which there may be lateral appendages, usually one on each side. The mode of attachment varies greatly; and when there is no petiole, the leaf is said to be sessile.

The forms of leaves are greatly varied, often obviously in adaptation to the habit of the plant, large and free-growing plants which obtain unobstructed light most frequently bearing simple or slightly lobed leaves, while the smaller vegetation generally produces leaves either long, simple, and narrow (e.g. grasses), or highly compound, with small leaflets (e.g. ferns), so as to seize as many as possible of the broken sunbeams which have not been intercepted by the loftier plants, while casting as little shadow as possible upon each other.

Again leaves may acquire entirely new functions, and have their form altered in correspondence with these. For protection, the leaf may be modified to form bristles, thorns, etc. Simple leaves may be conveniently reduced to three main forms, the *circular*, the *elliptical*, or the *oval*, according to the respective length and position of the longitudinal and the transverse diameter.

In compound leaves the leaflets may arise

one from another on each side of a median lobe, as in the *pedate* leaf of Hellebore, or may radiate in *palmate* fashion from a common point—the end of the petiole, as in horse-chestnut; or, as is most frequent, they may be placed at intervals along the midrib, like the ribs of a feather, when we have the *pinnate* arrangement of which the ash furnishes a familiar example.

The functions of leaves are threefold: (1) transpiration, or the getting rid of surplus water, absorbed with earthy salts by the roots; (2) respiration, or the interchange of inspired oxygen for expired carbon dioxide; and (3) assimilation, in which the carbon dioxide absorbed from the air is split up by the green coloring matter (chlorophyll), the oxygen being set free, and the carbon utilized as the foundation for organic products built up from water and earthy salts. This last function can take place only under the action of light.

Leaf Bug is the name given to heteropterous insects of the family *Tingitidæ*, including 1,000 known species, of which 250 are found in the United States. The insects usually live upon the leaves of plants, though not all of them are leaf feeders, and many are useful in destroying other insects. *Pæcilocapsus lineatus* is a great garden pest. They are usually small and delicate insects.

Leaf Insects, called also **Walking Leaves,** belong to the family Phasmodæ of the order Orthoptera. The female is markedly leaf-like, the resemblance being produced by the anterior wings (*tegmina*), which in shape, veining, and color very closely resemble the leaves among which the insect lives, and on which it feeds.

Leaf Mould, leaves so decayed as readily to break up into parts after the manner of soil or very rotten manure. It is of value as a fertilizer.

League, a measure of length. As a nautical measure, it equals one-twentieth of a degree, or three geographical m., 3.456 statute m.

League of Nations, an association of nations formed by virtue of the Covenant which constitutes Part I. of the treaties of peace with Germany, Austria-Hungary, and Bulgaria, signed on June 28, 1919, and subsequently, formally ending the Great War of Europe.

Past Effort.—Up to the time of the Great War (1914-19), attempts to improve international relations had taken the form of purely optional institutions. The Permanent Court of Arbitration, the International Commission of Inquiry, good offices, mediation, and arbitrations specially instituted are all of this char-

acter. Nations could or could not resort to them according as they saw fit.

The next step forward was made by the Bryan treaties, negotiated in pairs between the United States and more than 30 countries. Whereas The Hague simply invited inquiry, the Bryan treaties required it before nations might fight. We had in them for the first time in history an institution which actually forbids immediate resort to war and modified the old conception of the sovereignty of states to that extent.

Membership in the League was either by ratification of the Covenant as an international treaty or by admission by vote.

Organs.—By the terms of the Covenant, which became effective Jan. 10, 1920, the activities of the League of Nations were carried on through three separate bodies, the Assembly, the Council, and the Secretariat.

The *Assembly* met at Geneva on the first Monday of each September, the session continuing about four weeks. Functions special to the Assembly were the admission of member states (by two-thirds majority), election of non-permanent members of the Council, approval of any increase of Council members, passage of the budget, the voting of amendments to the Covenant for submission to member states for ratification, approval of the Council's nomination of a Secretary General. Both the Assembly and Council could deal 'with any matter within the sphere of action of the League or affecting the peace of the world.'

Beginning with the Third Assembly the division into six committees was unchanged, under the following heads: constitutional questions, technical organizations, reduction of armaments, budget and financial questions, social and general questions, political questions. The committees prepared reports on the matters before them and formulated resolutions, recommendations, or conventions.

The *Council* consisted of four permanent members, France, the British Empire, Italy, and Japan, and six non-permanent members elected by the Assembly. In the first three years the Council met frequently, but in 1923 arranged to meet quarterly, in March, July, September, and December. It had several functions special to it, chiefly executive in character. It could act as an organ of mediation in international disputes, and it formulated plans for the reduction of armament.

The third organ of the League was the permanent *Secretariat*, consisting of the Secretary

General, four under-secretaries general, four directors of general sections, nine directors of special sections, and thirteen chiefs of internal services, together with staffs. In general, the Secretariat prepared the work of the Assembly and Council, supplied secretarial requirements, and executed, or assisted in executing, their resolutions. The Secretariat was divided into sections, each of which was expert in its field.

A series of organizations growing out of Covenant provisions was developed. There were three types of committees. The Permanent Advisory Military, Naval, and Air Commission, the Permanent Mandates Commission, the third type was the expert committee, the members being chosen with a view to personal qualifications for the problem at hand.

In addition to committees, there were 'technical organizations,' consisting of the appropriate section of the Secretariat as a recording and data-collecting organ, the expert committee as an exploring body, and international conferences to give form to the matters they have identified as ripe for international decision.

Considered with regard to the existing form of international society, the Covenant of the League of Nations appeared to be a treaty establishing definite machinery of a permanent or periodic character and recording agreements taken by the contracting states with a view to promoting international co-operation and achieving international peace and security. The treaty form was indicated by the provision that withdrawal of a state could occur on two years' notice. The engagements assumed by the member states prescribed methods of doing business, established standards of conduct and determined principles of relationship. There was agreement by the member States on 22 issues regarding world peace and welfare, which included, armament; evils of private manufacture of war material; mutual friendship, territorial integrity and political independence; settlement of disputes; treaties; labor; traffic in women and children and opium and other dangerous drugs; prevention and control of disease; and promotion of Red Cross organizations.

Up to the beginning of the year 1939 the League Council had held 46 regular sessions.

The Council acted as a mediator between Finland and Sweden in the Aland Islands dispute, and reached a settlement in the vexed question of Upper Silesia; it repatriated thousands of war prisoners in Siberia, through the efforts of Dr. Nansen of Norway, acting

under the League; it administered the Saar Valley; it administered the Free City of Danzig; it created a permanent Mandates Commission to supervise the administration of the lands and peoples formerly under German and Turkish rule.

The Council also appointed the committee of jurists which drafted the original statute for the Permanent Court of International Justice; it transferred Eupen and Malmédy to Belgium; it negotiated the schemes for the financial reconstruction of Austria and Hungary and for the settlement of more than one million refugees on Greek territory. It extended the treaty guaranties of racial, linguistic, and religious minorities, and handled many problems arising out of that system.

The First meeting of the Assembly of the League of Nations was held Nov. 15, 1920, at Geneva, Switzerland. Forty-one nations were represented. The United States, Germany, and Russia alone of the great nations were lacking. Paul Hymans of Belgium, acting president, was made president of the Assembly.

The Second meeting of the Assembly was held in Geneva, Sept. 5, 1921. Forty-eight nations were represented.

The Third Assembly was held Sept. 4-30, 1922, with 46 state delegations in attendance.

The Fourth Assembly convened Sept. 3-30, 1923. The Irish Free State and Abyssinia were admitted to the League membership during the session.

The Fifth Assembly continued from Sept. 1 to Oct. 2, 1924. It was addressed by the British and French premiers, who together succeeded in reporting out the Protocol for the Pacific Settlement of International Disputes.

The Sixth Assembly convened from Sept. 7 to Sept. 26, 1925. The Protocol for the Pacific Settlement of International Disputes formed one of the most important keynotes for the Assembly.

On March 8, 1926, the Assembly met in special session to arrange for the admission of Germany to membership, with a permanent seat in the Council.

The Seventh Assembly convened from Sept. 7 to Sept. 25, 1926. The outstanding events of this session were the election of Germany to a permanent seat on the Council, the increase of non-permanent members from six to nine, the withdrawal of Spain, and the ratification of the Locarno Treaties.

In June-August, 1927, the Three-Power Naval Conference took place, but with no definite results.

In five years the League was directly responsible for the negotiation of more than 50 international conventions, on which 982 ratifications were deposited. The registration of treaties in 50 months was 764, an average of about 175 per year.

The Ninth Assembly of the League, in September, 1928, was notable for the efforts made by Herman Müller, the German Chancellor, to force from the Allies a declaration of evacuation of the Rhineland. Dr. J. Loudon, Dutch Minister to France, created consternation when, as chairman, he flatly refused to reconvene the Preparatory Disarmament Commission of the League.

The outstanding accomplishment of the Tenth Assembly, which met in September, 1929, was that concerning the Optional Clause of the World Court which provided obligatory judicial settlement for international disputes of a legal character.

The Eleventh Assembly of the League convened in September, 1930. Greatest accomplishment was formulation of the Draft Convention of Financial Assistance to Nations Victim of an Aggression; 29 nations (including Germany) signed the Convention.

The Twelfth Assembly met Sept. 7, 1931. The Legal Committee recommended the procedure to be followed in progressively codifying international law. The Disarmament Committee framed a convention which was adopted by the League for submission to the nations, and non-member States were invited to cooperate in the 1932 disarmament conference. The Social Committee secured the agreement of 35 nations to the convention adopted at the Narcotic Conference held in the Spring of 1931, and discussions of the Committee on slavery showed that 5,000,000 persons were still held in bondage in China, Ethiopia, Liberia and Arabia.

While the Council of the League was in session in September, 1931, open warfare broke out between Japan and China.

In 1932, the Lytton Commission reported in October in a spirit adverse to Japan's claims respecting Manchuria, and as a consequence Japan gave the requisite two years' notice of her intention to quit the League.

The countries which still remained outside the League in 1933 were Afghanistan, Saudi Arabia, Brazil (which had resigned with effect from 1928), Ecuador, Egypt, Soviet Russia and the United States. Member states totalled 57 (counting British Dominions as individual members), and the five permanent memberships of the Council were held by France,

Germany, Great Britain, Italy and Japan.

The United States Senate ratified, March 31, 1932, the International Convention for regulating manufacture and distribution of narcotics, provisionally signed the preceding year. On July 7, 1932, the Senate also ratified the League's convention for the regulation of whaling and protection of whales.

In 1933 when the World Economic Conference met in London, in June, under the auspices of the League, the attempts to prosecute the problem of disarmament only resulted in Germany's expressed intention to resign. Accomplishments during the year, however, included settlement of the Greenland dispute between Norway and Denmark and, growing out of the Economic Conference, international Pacts regarding Wheat and Silver.

An example of a definite accomplishment of the League is seen in the dissipation of a war threat, in December 1934, when Yugoslavia and Hungary accepted a resolution deploring the assassination of the Yugoslavian King Alexander which occurred in October of the same year.

Satisfaction was felt throughout the world when the United States announced her intention of registering all treaties, in future, with the League Secretariat.

Russia's adherence to the League (1934) offset the departure of Germany and Japan, in a measure, but the Powers at Geneva continued to miss the presence of the United States. In 1935 the U. S. Senate again rejected the League's dependent body, the World Court. The U. S., however, co-operated with the International Labor Office. The League's attempt to bring peace in the Chaco failed. All publications of the League of Nations were placed on sale throughout the world, the World Peace Foundation, Boston, being the American agent. All activities were reported in readable form in *The Monthly Summary of the League of Nations. The Handbook of the League of Nations, 1920-1924*, is especially valuable. For general discussion of the subject consult Brasol's *The World at the Cross Roads* (1921); *Ten Years of World Cooperation*; pub. by League of Nations, Foreword by Sir Eric Drummond (1930).

The League was unsuccessful in its efforts to stop the Italo-Ethiopian War. On January 3, 1935, Ethiopia appealed to the League to rule on the situation that had arisen from a clash of their troops with Italian troops on the boundary line between their country and the Italian colony of Eritrea. Italy agreed to submit the matter to a con-

ciliation committee of the League, and its report on the following September 3 cleared both sides of responsibility for the incident. Italy's reply, on September 22, included demands as follows:

1. Ethiopia must be disarmed.
2. Italy must control the direction of the armament and training of future Ethiopian military forces.
3. Italy must receive a large part of Ethiopian territory.
4. That if Ethiopia were granted a seaport, it should be on Italian territory.

The League Council made a report on October 5 declaring that war existed, and that, since Italy had disregarded its obligations under Article XII of the Covenant, she was the aggressor. This action had no precedent in the history of the League. It was almost unanimously approved on October 11 by the League Assembly, and the following sanctions were proposed:

(1) An embargo on arms, ammunition, implements and raw materials necessary for war; (2) cessation of loans and credit to the Italian Government; (3) embargo by League members on all goods from Italy; (4) mutual assistance among League members to minimize economic losses through the application of sanctions.

November 15, 1935, was fixed as the date for the sanctions to go into effect. They were ineffectively applied.

With unrestrained aggressions in defiance of the League by Germany, Italy and Japan, all of which, as well as several smaller countries, having withdrawn from membership, the League by 1939 had lost nearly all its prestige as an influence for peace, but continued to function as an instrument for the promotion of charity, co-ordination of health service, prevention of spread of disease, advancement of science and regulation of the opium traffic. In Dec. 1939 Finland appealed to the League when she was ruthlessly invaded by Soviet Russia. Russia was expelled but in the following year the League ceased completely to function.

Leagues, Historical. In Germany leagues of towns exercised considerable influence during the 14th and 15th centuries, whereas neither in France nor in England were any serious attempts made to form a similar union of towns. The crusades were, in a sense, leagues formed against the Turks; and the third crusade especially represented the close union of England, France, and Germany. With Charles VIII's expedition to Italy (1494) modern his-

tory began, and new conditions arose. During the 16th Century there were a number of leagues for a variety of purposes, the most famous of which were the Schmalkaldic League in Germany and the Catholic League in France. Towards the end of the conflict between France and Spain, which continued after the peace of Westphalia, Mazarin contributed to the formation of the League of the Rhine, which was composed of powerful German princes, and was intended as a check upon the emperor. During the 18th century the most famous league was that of France and Spain, which were united by a series of family compacts.

Early in the 19th century, following the battle of Waterloo (1815), the Holy Alliance was formed at the instance of Tsar Alexander, composed originally of himself, the Emperor of Austria, and the King of Prussia.

Out of the Holy Alliance grew the Concert of Europe, a system which embraced the Christian Powers of Europe and to which Turkey was admitted in 1856.

Leahy, William Daniel (1875-), Admiral in the U. S. Navy, was born in Hampton, Iowa; was educated at Annapolis. He served with the Nicaraguan occupation armies and in the Haitian campaign; in 1930 was commissioned Rear Admiral, in 1935, Vice-Admiral and in 1936, Admiral; in 1937, Chief of Naval Operations. He retired from the Navy in 1939 and was appointed Governor of Puerto Rico. In 1940 he was named Ambassador to the Vichy Government; in 1942 he was made Chief of Staff to Pres. Roosevelt; and in 1944, a 5 star Admiral.

Leander, in ancient Greek legend, a youth of Abydos, on the Hellespont, who loved Hero, the priestess of Aphrodite, in Sestos, and swam the strait every night to visit her. The lighthouse at Sestos guided him; but one stormy night its light failed, and he was drowned. Next morning his body was washed ashore at Sestos, and Hero, seeing it, cast herself into the sea. The story is told by Musæus in his epic of Hero and Leander, and is also referred to in the works of Ovid, Virgil and Christopher Marlowe.

Leap Year. When Julius Cæsar reformed the Roman calendar, he added a day every fourth year in order to make the average solar year 365¼ days. Every year exactly divisible by four except those that are divisible by 100 and not by 400 is a leap year.

Lear, Edward (1812-88), English artist and author of Danish descent, was born in

Holloway, London. From 1832 to 1836 he was at Knowsley, the residence of the Earl of Derby. During this time he drew the plates for the *Knowsley Menagerie*, and it was for the Earl's grandchildren that he made his famous *Book of Nonsense* (1846), which went through 27 editions. His works include *Nonsense Songs and Stories*; *Laughable Lyrics*; *Journal of a Landscape Painter in Corsica*.

Lease, the conveyance by which the conventional relation of landlord and tenant is created. Though usually employed to describe the written instrument of conveyance of land for a term of years, the term lease is equally applicable to a parol letting of lands or to the deed by which an estate for life is created. In the absence of a covenant to the contrary a tenant may assign his lease or sublet the premises. An assignment of his whole term does not relieve him from liability to his landlord unless the latter by word or deed accepts the assignee as his tenant in the place of the original tenant, and a breach of any of the covenants in the lease will entitle the landlord to evict the tenant and assignee, and look to the former for damages. A lease may be terminated by expiration of the term; breach of covenant by either party which is taken advantage of by the other; by total destruction of the premises by fire or other calamity; by agreement of the parties.

Lease-Lend Act (H. R. 1776). See **Lend-Lease Act**.

Leather, the hide or skin of animals which has been dried and subjected to certain chemical processes in order that decomposition may be arrested. Owing to the variety of purposes to which leather is applied, and the considerable differences in the hides and skins which are used in its manufacture, the processes of leather manufacture are complicated and numerous. Technically, the trade is divided into many sections, such as tanning, currying, and leather dressing.

Skins are classified according to the method and state of preservation as fresh or green skins, those fresh from the animal; dried, as the skins which are imported from Buenos Aires and from the Cape of Good Hope; salted, as those from Australia; and dried and salted, as those from Brazil and the West Indies. Green hides are ready at once for the process of cleansing and the removal of the hair, but dried hides must first be softened by soaking for from 10 to 14 days in cold water. After being cleansed and, when necessary, softened, the hides are immersed and moved about

in a milk of caustic lime, which loosens the hair by dissolving the cells of the epidermis. When the hides or skins come out of the limes, the loosened hair is removed by scraping on a sloping rounded wooden beam with a blunt two-handled knife. So far the process is the same, except in details, whether the goods are heavy hides for sole leather, or lamb and kid skins for gloves; but from this point it diverges. Sole-leather hides are usually merely washed with water to remove as much lime as possible, and after trimming or 'rounding' are ready to be tanned. Hides and skins for soft leathers, however, require not merely to be more carefully freed from lime, but brought down from their swollen condition to one of flaccidity and softness. This is usually accomplished by the action of fermenting infusions of excrement—that of pigeons and fowls being employed for hides and heavy skins, and that of the dog for the finer leathers.

Tanning with vegetable material is still more largely used than any other method of converting hides into leather. In principle it consists in bringing the prepared skin or hide at first into weak infusions of the tanning material, which have generally been previously used for more nearly tanned goods, and gradually changing and strengthening these infusions till the process is complete. The bark of the oak is one of the oldest and perhaps the most satisfactory of tanning materials, but hemlock bark and the leaves of the sumach are extensively employed, the latter especially for light and fancy leathers.

Tawing is a special process of tanning by combining equal parts of salt and alum with the gelatin of the skin fibre. It is used most successfully with the lighter leathers, such as those employed for gloves, and in preparing furriers' skins, from which the hair is not to be removed.

Chrome tanning is a short and inexpensive process which produces a soft, light, durable leather of close texture.

Shamoying or chamoising is the process of converting skins into leather by treating them with fats. The process gives a soft, pliable product particularly adapted for light-colored leathers.

Tanning by electricity is still in an experimental stage. The skins are dehaired and acted upon in the tanning vats by currents of electricity, and are then soaked in water three or four days, the tanning liquor being added from time to time until the fibre becomes leather.

Currying is the finishing process of all the

heaver 'upper leathers,' as well as of those intended for harness, belting, and other purposes where flexibility and resistance to water are required. In principle it consists in impregnating the leather with fats and oils. All well curried leather is smooth, supple, and pliant and of good grain and color.

The skins of different animals are valuable and suitable for different purposes. Alligator and crocodile skins have an unusual grain and are exceedingly durable; cowhide is used for traveling bags and heavy boots, calfskin for fancy goods and for enamelled and patent leather. Sheepskin is fine and pliable, but not particularly durable; it is used for shoe linings and gloves. Goatskin differs from sheepskin in having its fibres interlaced instead of running parallel; it is employed for morocco leather, and for patent and enamelled goods. Young goat or kidskin is thin and flexible and is used largely for gloves; pigskin is durable and handsome and is used for bags, saddles, and fancy leather goods; sealskin and walrus skin are both very strong and in great demand for bags, purses, and fancy articles. The skin of some kinds of fish is used for commercial purposes, such as porpoise skin and shark skin; and frog and snake skins are employed in novelty goods, as card cases, belts, and pocket books. For statistics of the leather industry consult Government reports.

Leatherback, a large leathery turtle (*Dermochelys coriacea*), which is found sparingly along the Atlantic Coast as far n. as Long Island and in the tropical parts of the Pacific and Indian Oceans, but which is everywhere rare.

Leather Beetle, a beetle belonging to the family *Dermestidae*, which in the larval state is very destructive to leather, as well as to other dried animal matter.

Leather Cloth, a textile fabric coated on one face with certain mixtures of a flexible nature when dry, so as to resemble leather.

Leatherjacket is the popular name of several fishes. It is found in tropical seas and on the eastern coast of the United States.

Leatherwood, **Moosewood**, or **Wicopy**, a deciduous shrub (*Dirca palustris*), of the order Thymeleaceæ, native to North America.

Leathes, **Stanley** (1830-1900), English Hebraist and writer, was born in Ellesborough, Buckinghamshire. He was educated at Cambridge.

Leaven, any substance, but particularly fermenting dough, which is used to induce fermentation in dough or paste, thereby render-

ing it light. The distinction between leavened and unleavened bread was of considerable importance in the ritual of the Hebrews.

Leavenworth, city, Kansas, co. seat of Leavenworth co., on the Missouri River. Two m. n. of the city is Fort Leavenworth, one of the largest and most important of the U. S. garrisons; p. 19,220.

The proximity of immense coal mines, yielding millions of bushels of coal daily, has made Leavenworth a manufacturing center. Carpets, stoves, furniture, engines, flour, carriages, boots and shoes, soap and chemicals, candy, and cereals are produced. It is the oldest city

in the co. Fruit growing and stock raising are important industries; p. 3,562.

Lebanon, town, New Hampshire, Grafton co. on the Mascoma River. It has lumber and flour mills, granite works, and a brickyard. At Enfield, nearby, is a Shaker community; p. 7,590.

Lebanon, city, Pennsylvania. Lebanon is situated in a rich iron region producing also a plentiful supply of brownstone, brick-clay, and limestone. Industries include large furnaces and rolling mills, chain and nut factories, and manufactures of silk, handkerchiefs, food products, shoes, hosiery,



Mount Lebanon.

A few remaining cedars are seen in the foreground.

in the State and was founded in 1854 by the Sons of the South and was a pro-slavery stronghold just before and during the Civil War.

Lebanon, city, Indiana, co. seat of Boone co. Industries include furniture factories, a tanning factory, novelty works, wheel works, milk condensery, grain elevators, flour and lumber mills, and manufactures of motor parts and cigars; p. 6,529.

Lebanon, city, Kentucky, co. seat of Marion co. It is the seat of St. Augustine's Academy, Loretto Academy, and has a national cemetery; p. 3,786.

Lebanon, city, Missouri, co. seat of Lac-

lede co. Fruit growing and stock raising are important industries; p. 27,206.

Lebanon, town, Tennessee. It is the seat of Cumberland University and Castle Heights Training School. It is one of the largest red cedar markets in the United States, and has an extensive trade in farm products. There are woolen mills, flour mills, and a pencil factory. Commission government has been adopted; p. 5,950.

Lebanon, Mount (Lat. *Libanus*), the western of the two mountain chains in Syria, called by the Arabs Jebel Libnan, 'the white mountains.' The mountains were once

covered with trees but are now quite bare, only a few groves of the famous cedars, found on Jebel Makmal, now remaining. Snow covers the mountain peaks at least half the year and always remains in the ravines. From 1861 to the World War the sanjak of Lebanon was ruled by a Christian governor under the protection of the Powers. In 1920 the Great Lebanon was proclaimed a Republic with Beirut (p. 134,660) as the seat of government, under the mandatory power of France; p. 796,284.

Lebanon Valley College, a coeducational institution established at Annville, Pennsylvania, in 1866, comprising a collegiate department and school of music. It is under the control of the United Brethren.

Le Bon, Gustave (1841-1930), French psychologist, best known for his works on crowd psychology. His writings include *The Crowd* and *L'évolution actuelle du monde* (1927).

Le Bossu, René (1631-80), French critic, won a European reputation by his *Traité du poème épique* (1675). It was well known in England, being praised by Dryden, used by Addison for his papers on *Paradise Lost*, and given in extract in the prefatory matter to Pope's *Odyssey*.

Le Brun, Charles (1619-90). French historical painter, was born in Paris. With the powerful assistance of Colbert he was one of the founders (1648) of the Academy of Painting and Sculpture and, in 1666, of the Academy of France in Rome. Le Brun enjoyed a great reputation in his day, but his style is now considered artificial and affected.

Le Brun, Marie Louise Elisabeth Vigée (1755-1842), French painter, was born in Paris. Her beauty and talent quickly made her a favorite at court, and she painted many of the great personages of the time, including Marie Antoinette, the Prince of Wales, Byron, and others. The Louvre contains many of her best works, notably the portrait of herself and her daughter.

Lecce (anc. *Lupiae Civitas*), city, Italy. Its ancient fortifications are now in ruins, although several monumental gateways still remain. There is trade in Lecce oil, tobacco, cotton, wool, soap, and leather, while the district produces fruit and grain. The city is connected by electric cars with San Cataldo, much visited on account of its castle; p. 55,398.

Lecco, city, Italy, on the e. arm of Lake Como. It is an industrial town and manu-

factures iron, copper, silk, olive oil, and cotton. Manzoni, who describes the district in his *I Promessi Sposi*, is commemorated by a fine statue; p. 28,739.

Lecithin, a compound, or mixture of compounds, or complex composition, an important constituent of brain and nerve tissue and yolk of egg. It may be prepared from the latter, and is soluble in alcohol, from which it crystallizes in waxy needles, hygroscopic but insoluble in water.

Lecky, William Edward Hartpole (1818-1903), Irish historian. Among his works were *History of Rationalism in Europe* (1865); *History of European Morals from Augustus to Charlemagne* (1869); *History of England in the Eighteenth Century* (1878-90); *Democracy and Liberty* (new ed. 1899); and *The Map of Life* (new ed. 1901).

Leclaire, Edmé Jean (1801-72), originator of the system of profit-sharing between employer and employed. His system was first tried in 1842, and proved eminently successful.

Lecompton Constitution, a constitution drawn up by a pro-slavery convention in Kansas which met at Lecompton in Sept.-Nov., 1857. It provided, among other things, that 'the legislature shall have no power to pass laws for the emancipation of slaves without the consent of the owners,' and that 'free negroes shall not be permitted to live in this state under any circumstances.' Congress was asked to admit Kansas as a state under the Lecompton Constitution, and the question became a national one. The Lecompton Constitution was finally disposed of, Kansas being ultimately admitted to the Union as a free state, 1861.

Le Conte, Joseph (1823-1901), American geologist and educator. He was professor of geology and natural history at the University of California (1868-1901). Among his numerous publications are *Religion and Science* (1873); *Outlines of the Comparative Physiology and Morphology of Animals* (1878); *Sight: An Exposition of the Principles of Monocular and Binocular Vision* (1880); *Evolution: Its Nature, its Evidences, and its Relations to Religious Thought* (1887).

Leconte de Lisle, Charles Marie (1818-94), French poet. Leconte de Lisle's first poem, *Venus de Milo* was published in 1848, and showed a keen interest in politics, with a strong republican bent. His *Poèmes Antiques*, which appeared in 1852, contained

some of his best work. He was a strong pessimist and anti-Catholic. But even when he is dealing with themes which might evoke these sentiments, he treats them only with a poetic passion. His works include *Poèmes Antiques* (1852); *Poèmes et Poésies* (1854); *Le Chemin de la Croix* (1859); *Poèmes Barbares* (1862); *Poèmes Tragiques* (1884); *Derniers Poèmes* (1899); *L'Apollonide*; and numerous translations.

Lecouvreur, Adrienne (1692-1730), celebrated French actress. Going to Paris, she quickly achieved success by her talent and beauty; and her real life, like her acting, was a stormy Elysium, filled with the loves of many famous men, including Marshal Saxe and Voltaire. Her death was attributed to poison administered by the Duchesse de Bouillon, a rival for Saxe's affections; whence the plot of Scribe and Legouvé's play *Adrienne Lecouvreur*.

Lectern, a reading stand, used in churches for reading the *lections* or lessons from, and for supporting the massive service books from which the antiphons were sung, as also for use in libraries. They were generally movable, perhaps the commonest form being that of an eagle with outspread wings on which the book rested.

Lectionary, a book containing 'lessons' or portions of Scripture appointed to be read in the public service of the church in the course of a year. The oldest Latin lectionary, ascribed to St. Jerome, was known as the *Comes* ('companion'), distinguished as 'major' and 'minor.'

Leda, in ancient Greek legend, was the daughter of Thestius, and wife of Tyn-dareus, king of Sparta, to whom she bore Timandra and Philonoe. Zeus visited Leda in the form of a swan, and by him she was the mother of Castor and Pollux.

Ledum, a genus of dwarf, hardy, evergreen shrubs, belonging to the order Ericaceæ.

Ledo Road, a road starting in Ledo, India and extending across the Naga Hills in Burma more than 100 miles to the Hukwang Valley in northern Burma. Begun in December 1942, it was completed in a year. It was used to transport supplies to the Chinese forces in northern Burma.

Lee, a word meaning a sheltered place, and, in its nautical sense, those parts that are away from the windward side. 'Leeway' is the way a ship makes away from the windward quarter when under sail, so that her wake is not in the same straight line as her keel. 'Lee-side,' all that part of a ship

which is away from the windward quarter, consisting of half the ship, divided by an imaginary line fore and aft. 'Lee-shore': a ship is said to be on a lee-shore when she is near the land with the wind blowing from her to it. 'Helm a-lee' is the order to put the helm down towards the leeward side, so as to bring a ship nearer to or into the wind.

Lee, tn., Berkshire co., Mass., on the Housatonic R.; situated in a beautiful hill region, it is well known as a summer resort. The leading industries are the manufacture of paper and paper-mill machinery, marble quarrying and lime burning. Fern Cliff, a high ridge in the center of the town, is of special scenic and geologic interest. (See Emerson, *Bulletin of the U. S. Geological Survey*, No. 159, pp. 85, 86); p. 4,222.

Lee, Ann (1736-84), foundress of the American Society of Shakers, was born at Manchester, England, the daughter of a blacksmith. She took to open-air preaching in Manchester, which led to imprisonment for Sabbathbreaking (1770), and while thus confined a vision of Christ and a revelation regarding His second coming was said to have been granted to her, as well as the Shakers' doctrine of continence. Subsequently she became head of the Shakers, and was styled 'Mother Ann.' Emigrating to America (1774), she founded the first American Shaker settlement at Niskenna, now Watervliet, N. Y. (1776).

Lee, Arthur (1740-92), American diplomatist, the youngest son of Thomas Lee born at Lee homestead, Stratford, Va. He practiced law with considerable success in London, where he also, as a pamphleteer and writer for the press, took an active part, on behalf of the American colonists, in the political discussions preceding the Revolution. He served as American diplomat in the Revolution, going to England, France, and Spain.

Lee, Charles (1731-82), an English-American soldier, prominent in the American Revolution. He entered the English army in 1751, took part (1755-60) in the French and Indian War in America, and in 1762, as a lieutenant-colonel. He was in the Portuguese service in 1762 and in the Polish service (1764-6 and 1769-70), and in 1773 he emigrated to America. He was made a major-general in the Continental army, his rank being higher than that of any officer except Washington and Artemas Ward (who soon resigned). He betrayed

Washington's plans to the British but his treason was not discovered at once. He was suspended for a year for his conduct at the battle of Monmouth, and subsequently, for insolence to Congress, he was discharged from the service.

Lee, Fitzhugh (1835-1905), American soldier and diplomat, was born at Clermont, Va. On the outbreak of the Civil War (1861) he joined the Confederate army, afterwards serving with distinction in Va. as a cavalry officer. He was governor of Virginia (1886-90). He was U. S. consul at Havana, Cuba (1893-8), and afterwards was for some time military governor of Havana. He became a brigadier-general in the regular U. S. army. He wrote a military biography of his uncle, *Robert E. Lee* (1894).

Lee, Francis Lightfoot (1734-97), signer of the Declaration of Independence, was born in Stratford, Va. After serving in the Virginia House of Burgesses (1765-75), he was elected a delegate to the Continental Congress, 1775-9, signed the Declaration, and helped to draw up the Articles of Confederation. He took a firm attitude against Great Britain in the matter of the Newfoundland fisheries and the navigation of the Mississippi.

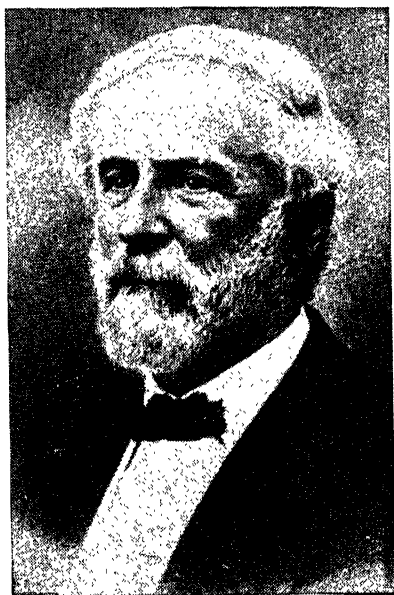
Lee, Henry (1756-1818), American soldier, the father of Robert E. Lee. He entered the Continental army as a captain in Mar., 1777, and by the celerity of his movements earned the sobriquet 'Light-horse Harry.' His most brilliant exploit was his successful attack on Paulus Hook, N. J., in August, 1779; for this he received from Congress a commemorative medal and a vote of thanks for his 'remarkable prudence, address, and bravery.' Unlike his brother, Richard Henry Lee, he advocated the ratification by Va. of the Federal Constitution of 1787, and supported Madison in the Va. convention of 1788; and though he was at first strongly opposed to the centralizing policies of Alexander Hamilton after the organization of the national government, he gradually identified himself with the Federalists. In 1799-1801 he was a Federalist representative in Congress, delivering a memorial oration at the time of Washington's death, in which Washington was spoken of as 'first in war, first in peace, and first in the hearts of his countrymen.'

Lee, Richard Henry (1732-94), American political leader, born at the Lee homestead, Stratford, Va., a member of the Va.

House of Burgesses (1761-88), in which he advocated the suppression of the slave trade, and both before and during the American Revolution was one of the foremost of the Whig and revolutionary leaders in Va. He was an influential member of the Continental Congress, being remembered particularly as the introducer of the resolution that 'these united Colonies are and of a right ought to be free and independent states, and that all political connection between them and the state of Great Britain is, and ought to be, totally dissolved.' With Patrick Henry, he opposed the ratification by Va. of the Federal Constitution of 1787, but was a member of the U. S. Senate (1789-92), and, though elected as an Anti-Federalist, supported the administration of Pres. Washington. He drew up and proposed, substantially as it was later adopted, the Tenth Amendment to the Federal Constitution.

Lee, Robert Edward (1807-70), a celebrated American soldier, the greatest of the Confederate leaders during the Civil War, born on Jan. 19, 1807, at Stratford, Va., the estate of his father, the famous 'Light-horse Harry' Lee of the American Revolution. His mother was a member of the Carter family, and both the Lees and the Carters had long been among the foremost families of Va. in social standing and influence. Robert graduated in 1829, second in his class, at West Point, and in June, 1831, he married Mary Randolph Custis (the great-granddaughter of Washington's wife), whose father's home, Arlington, just across the Potomac from Washington, D. C., was thereafter the home of the Lees. Lee was assigned to the engineer corps of the U. S. army. His first active service was in the Mexican War (1846-7), in which he took a distinguished part as a member of Gen. Scott's staff. He was superintendent of the Military Academy at West Point (1852-5); was made a lieutenant-colonel in March, 1855. While at Arlington, on a leave of absence, he commanded the U. S. troops, which overcame and captured John Brown at Harper's Ferry. After the secession of Texas he was recalled to Gen. Scott on Mar. 1, 1861. His position at this time when an outbreak of hostilities between the North and the South seemed certain was a difficult one. Though himself a slaveholder, he had long believed that slavery was an evil, both for the blacks and for the whites. He regarded emancipation as certain to come in time, but believed that "it

will sooner result from the mild and melting influences of Christianity, than from the storms and tempests of fiery controversy.' He, therefore, was opposed to all anti-slavery agitation from outside, and particularly resented the propaganda of the Abolitionists. In this he thoroughly agreed with the South, but he did not believe in secession and he loved the Union, though he felt that his first duty was to his state. On April 18, 1861, Pres. Lincoln offered to him the command of the army of invasion; this he refused, and two days later he resigned from the U. S. army. On April 22d, as major-general, he was placed in command of the



Robert E. Lee.

military forces of Virginia, which he thoroughly organized; on May 25th he became a brigadier-general in the Confederate army, and was for some time in close and constant association with Pres. Davis as his military adviser. In March, 1862, he was charged with the direction, under Pres. Davis, of all military operations of the Confederate armies. He superintended from Richmond the operations in the Peninsula and when Gen. J. E. Johnston was wounded at Seven Pines, Lee assumed command in the field (June 1, 1862) of the Army of Northern Virginia, at whose head he re-

mained throughout the war. The history of the war, on the Confederate side, in the East is, therefore, largely a history of Lee's operations. In 1864-5, while he was engaged, against Gen. Grant, in the final campaigns of the war, he fought stubbornly and with consummate ability against heavy odds, but was finally forced to surrender at Appomattox Court House on April 9, 1865. With his surrender the Confederacy collapsed. Gen. Lee saw with the utmost clearness what this meant for him and for the South, and on June 13th he made formal application for a pardon, which he never received; however, an indictment for treason which was found against him was never pressed to a trial. Personally Gen. Lee wished to pass his remaining days in peaceful retirement, but realizing that the future of the South would depend largely on the education of the Southern youth, he accepted (Aug. 24, 1865) the presidency of Washington College at Lexington, Va., which position he retained until his death. After his death the institution was renamed the Washington and Lee University. His position during the trying Reconstruction Period was characteristic: he saw the necessity of adjusting himself to conditions as they were, and the folly of cherishing animosities and of wasting time in vain repinings over a 'lost cause.' Lee is generally regarded by military critics as the greatest leader on either side during the Civil War, and one of the greatest leaders of the 19th century in any country. His greatness, however, was a greatness of character even more than of ability; and in many respects he reminds one of Washington. See *The Recollections and Letters of Robert E. Lee* (1904), by Robert E. Lee, Jr.; Bradford's *Lee the American* (1912), and Freeman's *Robert E. Lee* (1934).

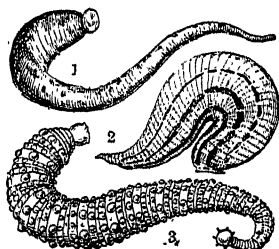
Lee, Sidney (1859-1926), English man of letters, editor of *The Dictionary of National Biography*. His biographies of 'Queen Victoria' and 'Shakespeare,' were published, in revised and enlarged editions, as books. He also wrote a work on *Stratford-on-Avon* (1885), and another on *Great Englishmen of the 16th Century* (1904). He visited the U. S. in 1903.

Lee, William (1737-95), American diplomatist, the son of Thomas Lee, born at Stratford, Va., the homestead of the famous Lee family of Va. For several years before the American Revolution he lived, as a merchant, in London. He was a com-

mercial agent of the U. S. in France in 1777-8, and in 1778-9 was nominally the diplomatic representative of the U. S. to Austria and Prussia, but had no official standing at Vienna or Berlin owing to the refusal of the two countries at that time to recognize the U. S. as an independent nation, and actually resided in Paris and in Frankfort-on-the-Main.

Leech, John (1817-64), English artist and caricaturist. It is as a political cartoonist in the pages of *Punch* that Leech is pre-eminently known. He also illustrated A'Beckett's *Comic History of England* (1847-8) and *Comic History of Rome* (1852), and Hood's *Comic Annual*. His *Punch* drawings were republished as *Pictures of Life and Character* (1854-69) and *Pencilings from Punch* (1864-5).

Leeches are modified annelids, or ringed worms, adapted to a special method of life. A typical example is *Hirudo medicinalis*, one of the medicinal leeches, still used in blood-letting. It lives in fresh water, and is common in Germany, Bohemia, and Russia. The



Leeches.

- 1, Medicinal leech; 2, horse leech; 3, skate-leech.

diet consists of the blood of vertebrates, to which the leech attaches itself by its suckers. Within the mouth lie three triangular tooth-plates, by means of which a small tridactate incision is made in the skin of the animal attacked. This done, the leech proceeds to fill its crop, which extends almost from end to end of the body, and has eleven lateral pockets. When these have become distended with blood, the leech drops from its temporary host, and the slow process of digestion begins. The eggs are laid in cocoons in damp earth. Apart from the familiar medicinal leech, a number of other leeches occur, some in fresh water, some in salt, and some on land in damp places, and many species inhabit the United States.

Leeds, munic., parl., and co., bor., in Yorkshire, England. It is situated on the Aire, by which it has water communication with the Humber, while the Leeds and Liverpool Canal connects it with the western seaboard. The Yorkshire College, constituted 1874, became in 1887 one of the constituent colleges of the Victoria University, Manchester, and is now established as a self-contained university. It includes textile and art departments, founded by the Clothworkers' Company, affording practical instruction in the various branches of cloth manufacture. Leeds is the chief center of the woolen industry in England, established in the middle ages; but the modern development of Leeds dates from the introduction of steam-power machinery towards the close of the 18th century. Other large industries include locomotives, machinery, heavy iron and steel goods of all kinds, chemical, glass, printing, leather goods and pottery; p. 492,000.

Leeds, Thomas Osborne, Duke of (1631-1712), English Statesman. A zealous Protestant, in political life he is stated to have been 'greedy of wealth and honors, corrupt himself, and a corrupter of others.' Charles II. held him in high favor, and he acquired great power. Accused of intrigue and bribery, he was committed to the Tower, and remained there for nearly five years. At the revolution, declaring himself an adherent of William of Orange, he received promotion as president of the council and Duke of Leeds (1694).

Leek, a liliaceous plant long cultivated for the lower part of its leaves, which form a thick succulent stem, much used in soups and stews, especially in French cookery. The seed should be sown in February, and the young plants should be planted out in deeply-dug and richly-manured soil, nine inches being left from plant to plant. Leek requires liberal applications of water. The blanching is effected by earthing up the stems as growth proceeds, care being taken not to bury the crowns. The leeks should be fit for use from September to March or April. The leek is the emblem of the Welshmen, worn on St. David's Day, March 1.

Leeuwarden, town, Netherlands, cap. of prov. of Gröningen; contains a Frisian museum, and a royal palace (1587-1747). It has manufactures of linens, musical instruments, vehicles, and glass, and large cattle and fruit markets; p. 47,701.

Leeuwenhoek, Anton Van (1632-1723), Dutch microscopist, who made an extra-

ordinary number of discoveries with relatively very imperfect instruments. He lived and died at Delft. Most of his observations are described in the *Philosophical Transactions* of the former and the *Memoirs* of the latter body. He studied the circulation of the blood in the frog's foot, thus confirming Harvey's discovery. He attempted to disprove spontaneous generation; and succeeded in proving the natural generation of weevils in wheat, of ells, of aphides, of mussels, and of some other forms at that time supposed to rise *de novo* from inorganic substances.

Leeward Islands, groups of the Caribbean Islands extending s.e. from Porto Rico, and including Antigua, St. Kitts, Dominica, Montserrat, and the Virgin Islands. The islands are of volcanic origin, and contain some lofty peaks, the highest being the Morne Diablotin (5,314 ft.) in Dominica.

Lefebvre, François Joseph, Duc de Dantzick (1755-1820), marshal of France. He assisted Napoleon in overturning the Directory (1799); and served in the Peninsular War, and throughout the Russian campaign (1812), and assisted in the defensive operations against the allied armies before the surrender of Paris.

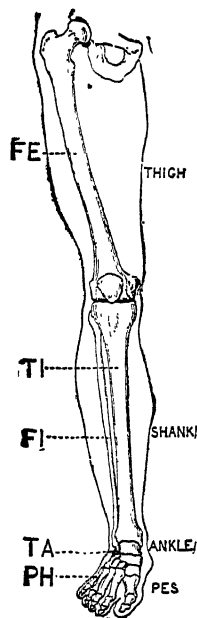
Lefebvre, Jules Joseph (1836-1912), French painter, distinguished himself especially as a painter of the nude, of which his allegorical picture of *Truth* in the Luxembourg is a good example. His style in his later works—e.g. *Lady Godiva* (1890) and *A Daughter of Eve* (1892)—became somewhat modified.

Lefferts, Marshall (1821-76), American engineer and inventor, became president of New York, New England and N. Y. State telegraph companies (1849-60), retiring to develop a system of automatic transmission. This was sold to the Western Union (then American) company, of which he became electric engineer. He became president of the Gold and Stock Telegraph Company, 1869.

Left-handedness. See **Right-handedness.**

Leg. All vertebrates above fishes have the limbs constructed on the same plan. Each limb is divided into four parts, named as follows in fore and hind limb respectively: upper arm (brachium), fore arm (anti-brachium), wrist (carpus), and hand (manus); thigh (femur), shank (crus), ankle (tarsus), and foot (pes). The upper segment of both limbs contains a single bone,

known as humerus and femur respectively; but the next segment primitively contains two, the radius and ulna in the fore arm, and the tibia and fibula in the shank. There are never more than five complete digits, but in amphibians and some reptiles traces of extra digits may be observed. In human anatomy the leg contains a third bone, the patella or kneecap, which lies in the tendon of the quadriceps extensor muscle, and articulates with the femoral condyles. The



Human Leg.

FE, Femur; TI, tibia; FI, fibula;
TA, tarsus; PH, phalanges.

tibia, or shin bone, articulates with the femur above, and at its lower end with the astragalus, as well as laterally with the fibula. The fibula lies externally to the tibia, and articulates with it at its upper end without entering into the formation of the knee joint. At its lower end the fibula articulates with the astragalus and with the tibia. Between the two long bones of the leg is stretched the strong membrane, which with the bones affords attachment to the muscles of the calf. At the upper end of the tibia is inserted the ligamentum patellæ, or tendon of the quadriceps extensor muscle, which straightens the limb. Be-

hind are attached the hamstring tendons. The chief muscles arising from the anterior aspect of the leg flex the ankle and extend the toes, while those on the posterior aspect have the opposite effect. The superficial muscles of the calf have a common tendon, the tendo Achillis, which is inserted into the os calcis, or heel bone. The arteries of the leg are all branches or divisions of the popliteal artery. The chief veins are the anterior and posterior tibial and the internal and external saphenous. The chief nerves of the leg are the posterior tibial and the external saphenous.

Legacy. A gift of personal property by last will and testament. A legacy is either general—*i.e.* payable out of the residue of an estate; demonstrative—*i.e.* primarily payable out of a specific fund, but if the fund is exhausted then out of residue; specific—*i.e.* a legacy of a special object or a particular investment. A specific legacy is paid in preference to all other legacies, but is liable to ademption—*i.e.* revocation in whole or in part in some other way than by a testamentary instrument—as, for example, by a gift during life. Specific legacies are not subject to abatement until all the other personal property has been exhausted. Anything which may be identified may be the subject of a specific legacy, even money in a particular place or fund, or out of a claim due the testator. A demonstrative legacy is not subject to abatement with general legacies, that is, made applicable to pay debts, or reduced because of insufficient assets to pay all in full, except as to any portion of it remaining unpaid after the particular fund out of which it was payable is exhausted, this balance being treated as a general legacy. General legacies being payable out of the general or residuary estate, abate ratably in case there are not sufficient assets to pay them all, or there is not sufficient personal property remaining after payment of debts to satisfy them all in full. However, a testator may specify the order in which general legacies shall be paid, and his wishes will be carried out, even if all cannot be satisfied. The general rule is that legacies are payable in one year after the death of the testator, but this is regulated by statute, and in some states may be extended by the court.

Legal Education. The important rôle played by the legal profession in the administration and development of the law has in most civilized countries resulted in some

form of regulation of legal education by the state. In the United States admission to practice has always been regarded as a function of the state, but the professional education on which it was based has been and still is in private hands. However, an examination in law set by the courts is prescribed for all candidates for admission to the bar. The official examinations for the bar are still open to candidates who have had no other formal training therefor. The advantages of systematic study of the law under competent instruction have, however, become so apparent that a large and growing proportion of students are pursuing their legal studies in the numerous law schools of the country. The best of these, especially those connected with the great universities, now afford a comprehensive training, extending over three years of professional study, and covering all the important subjects of the legal curriculum. A professorship in law was established in 1779 at William and Mary College, at Columbia College in 1794, at Harvard in 1815. There are now over 100 law schools in the United States, over two-thirds of which are connected with universities. The methods of instruction vary. In a number of schools, principally those connected with universities, the 'case system,' which was introduced at Harvard, in 1870, by Professor Langdell, is employed. Under this system the student reads selected reported cases, either from reprints in 'case books' or from the original reports, and then is called upon in the lecture-room to state the cases and the result of his thought and analysis of them. Discussion and argument, within proper bounds, are encouraged among the students in the lecture-room, and eventually the instructor gives his views. Harvard and Columbia have taken the lead in requiring the equivalent of a college course as a prerequisite to admission to their law schools, but many excellent law schools have a lower standard in the matter of preliminary education. The graduate of an American law school usually receives the degree of bachelor of laws (LL.B.) and many schools make provision for further study leading to higher degrees, such as master of laws (LL.M.) and doctor of civil law (D.C.L.). Consult the reports of the committee on legal education in the annual reports of the American Bar Association.

Le Gallienne, Eva (1899-), actress, daughter of Richard Le Gallienne, born in

London, England, educated in Paris, France, and has received honorary degrees from several U. S. colleges. Her début was in London in 1915, and her first appearance in New York, 1916, in *The Melody of Youth*. She has starred in many notable productions, including most recently, *Allison's House*, *Camille*, *Liliom*, *Dear Jane*, *Alice in Wonderland*. In 1926, founder, and since director of the Civic Repertory Theatre, New York City.

Le Gallienne, Richard (1866), English author and journalist. In 1898 he came to the United States on a lecture tour, and afterward made his home in New York. Among his many works are *Volumes in Folio* (1888); *The Book Bills of Narcissus* (1891); *English Poems* (1892); *The Religion of a Literary Man* (1893); *The Quest of the Golden Girl* (1896); *The Life Romantic* (1900); *Romances of Old France* (1905); *Little Dinners with the Sphinx* (1907); *Pieces of Eight* (1919); and *The Romantic '90's* (1925).

Legal Tender. See **Tender**.

Legato. A term in music signifying that the passage must be rendered smoothly, the notes succeeding one another without perceptible break.

Legend was at first applied to written chronicles, or narratives, especially those of the mediæval church. What was pre-eminently known as 'The Legend' was the 13th-century compilation of the lives of saints, by Jacobus de Voragine, archbishop of Genoa, more popularly spoken of as 'The Golden Legend,' or *Legenda Aurea*. *The Legend of the Three Kings* was a religious drama or miracle play, of which the earliest ms. appears to belong to the 11th century. The term 'legend' was also applied to any inscription or motto, as it still is by numismatists. As understood at the present day, legends are popular traditions current among uneducated people in civilized countries, or constituting the unwritten history and mythology of primitive races, inherited from a remote past. In many cases it is difficult to draw the line between legend and true history. One cannot absolutely dismiss as non-historical such legendary accounts as the Scandinavian *Sagas* and *Eddas*, the Finnish *Kalevala*, the Teutonic *Heldenbuch* and *Nibelungenlied*, and the *Nihongi* of the Japanese. Of recent years there has been a growing recognition of the importance of these inherited beliefs, which, under the modern name of folklore, are studied

by scholars of all nations. See **FOLKLORE**.

Legendre, Adrien Marie (1752-1833), French mathematician. In his *Nouvelles Méthodes pour la Détermination des Orbites de Comètes* (1806) he invented the rule of the 'least square of errors,' a mathematical device which has since become familiar. His *Eléments de Géométrie* (1794) and other works have been popular text-books in American schools and colleges. His greatest work, *Traité des Fonctions Elliptiques*, only appeared in 1825-32.

Legge, James (1815-97), English sinologist. He achieved world-wide reputation through his writings on China, particularly by his edition of the Chinese classics, begun in 1841, and finished shortly before his death. He was appointed professor of Chinese language and literature at Oxford (1876).

Leghorn (It. *Livorno*; anc. Labronis), fort. seapt. and city, prov. Leghorn, Tuscany, Italy, is situated on a low and somewhat marshy plain. Much of its prosperity, which dates from 1421, was due to the energy and enterprise of the Medicean grand-dukes, who, recognizing the value of its situation, largely extended and beautified the town. In 1855 a double harbor was constructed. The harbor is protected by a mole over half a mile long, with a lighthouse at each end. It exports hemp, hides, marble, olive oil, coral, candied fruit, wine, soap, boracic acid, and hats; and imports coal, fish, tobacco, wheat, and raw hides. Shipbuilding, glassmaking, copper and brass founding are the principal industries. It is the seat of a bishop, and has a beautiful 17th-century cathedral and a large naval academy; p. 129,000. It was bombed in World War II.

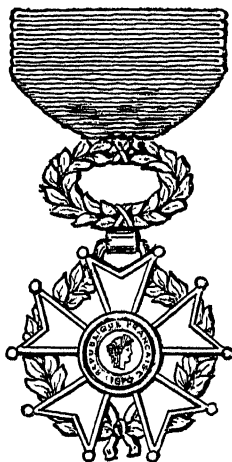
Legion, in Latin *legio*, was the name of the divisional unit of a Roman army.

Legion of Honor, French order of merit, created in 1802 by Napoleon, when first consul, with the view of specially marking exploits and services in the military and civil departments. Napoleon himself was first grand master. The head of the republic is the grand chancellor of the order.

Legislation, The Society of Comparative. This society was formed in England in 1894 to promote the comparative study of law, by collecting evidence as to how the numerous legislatures of the world deal with the same subjects. The society publishes *The Journal of Comparative Legislation*.

Legislation and Legislative Processes. Legislation may be defined as the enuncia-

tion of general rules of conduct in express terms. The process through which every complete legislative act or statute must necessarily pass may be analyzed into the three stages of proposal, criticism, and acceptance. The power of proposing or initiating legislation is more important than it might at first view seem. The framer of a motion generally has a powerful influence over its character and scope. At the



Cross of the Legion of Honor.

least he obtains most of the credit if the result is successful, while he divides the obloquy if it is a failure. Accordingly, we notice that the right of proposing legislation is often jealously guarded. The period of criticism and discussion is the next stage in the process of legislation. This right has, at different times, been exercised by different authorities. As a general rule, no discussion took place in the popular assemblies of the ancient world. Measures submitted to them had been carefully considered by an aristocratic body, a *boulé* or senate; and the function of the assembly was to say 'yes' or 'no.'

After the stage of criticism and discussion has been passed, and the measure is ready for completion, it not infrequently happens that the formal assent of some external authority must be obtained, in order to render it binding. This is more especially the case when the proposal and framing of the measure have been the work of a representative body, as in the Congress of the United States. Usually the right of ac-

ceptance involves the unlimited right of rejection; but the president of the United States, and the governors of the respective States, although in most cases vested with the so-called 'veto,' cannot maintain it against the determined resolution of the houses expressed by substantial majorities. The most novel, and in some respects important, form of the accepting power is that practiced regularly in Switzerland, rarely (and only on certain questions) in France and with increasing frequency in the United States, known as the *referendum*. By this practice the consent of the electors to a measure framed by the legislature is directly asked, and on their answer depends the entire fate of the measure. The referendum, it should be noticed, is regularly practiced in England in local matters. Consult Bryce's *Studies in History and Jurisprudence*; Luce's *Legislative Procedure* (1922); Leek's *Legislative Reference Work* (1925).

Legislature, the law-making authority of a country or state. The highest degree of authority in making laws is exemplified by the Parliament of the United Kingdom. The King in Parliament—i.e. the King acting by and with the advice and consent of the Lords Spiritual and Temporal and Commons in Parliament assembled—can make or unmake any law whatsoever, including laws which alter the constitution of the realm. Parliament is therefore said to be a sovereign legislature. In countries such as the United States and France the power of the legislature is limited by the constitution, and is therefore not sovereign.

Legitimacy, in law, the status of a child born in wedlock. Under the common law a child born in wedlock is presumed to be legitimate in the absence of conclusive evidence to the contrary, as, for example, that the husband had been away from his wife for a longer time than the period of gestation could possibly extend. In some of the States of the United States a child born out of wedlock may be legitimized by the subsequent marriage of its parents, in which case no distinction is made in law between it and children subsequently born to the parents. Illegitimacy does not affect the civil status of a person otherwise than under the laws of descent and distribution. In England the law is more harsh. See **BASTARD**; **ILLEGITIMACY**.

Legitimists, **The**, in France, the party which, after the overthrow of the Bourbon monarchy in 1830, and the accession of the

Orleanist Louis Philippe, favored the return of the Bourbons.

Legnago, city, Italy, one of the four fortresses of the Quadrilateral. Its fortifications were dismantled by Napoleon in 1801, but it was re fortified by the Austrians in 1815. It is a grain, rice and wine market; p. 3,662.

Legouv  , Ernest (1807-1903), French dramatist and author. He attracted attention by his *Histoire morale des femmes* (1849) and *La femme en France au XIX. si  cle* (1864), followed by *La science de la famille* (1867) and *Messieurs les enfants* (1868). Among his dramatic writings are *Adrienne Lecouvreur* (1849); *Bataille de dames* (1851) (both written with Scribe); *M  d  e* (1856); *Les deux reines de France* (1865); and *La consid  ration* (1880).

Legume, the name given to the fruit of plants belonging to the Leguminos  , such as peas and beans. It consists of a solitary two valved carpel, bearing its seeds along the ventral suture. It is popularly known as a pod.

Legumin, or **Vegetable Casein**, an albumin which occurs in the seeds of leguminous plants. It can be coagulated by acids, redissolves in alkalis, and so closely resembles the casein of milk that a kind of cheese is prepared in Japan from an extract containing it obtained from the soy bean.

Leguminos  , a natural order of plants containing an enormous number of species, including some of our most beautiful flowering plants, and also some plants of great economic value. The flowers have a five-cleft calyx, and usually five petals. From their general resemblance to butterflies the flowers are said to be papilionaceous. The pea, bean, vetch, locust, broom, trefoil, and sainfoin are well known species.

Leh, town, India, is a walled city, about 11,500 feet above sea-level. It is the starting-point of the caravan routes into the Pamirs and Tibet, and commands the entrances to the several passes to the n. and e. It is the headquarters of a British political officer. It exports wool for shawl making; p. 5,000.

Lehigh University, a non-sectarian institution at South Bethlehem, Pa., established in 1866 by Judge Asa Packer of Mauch Chunk to provide for young men of the Lehigh Valley a complete education for the professions represented in the development of the resources of the surrounding region. In furtherance of this design the

university offers courses in civil, mechanical, marine, metallurgical, mining, electrical and chemical engineering, electrometallurgy, chemistry, geology, physics, etc., and ranks high among technical schools. There is also a department of arts and sciences, and a college of business administration.

Lehman, Herbert H. (1878-), Democratic governor, born in N. Y. City. In 1908 he became partner in the banking firm of Lehman Bros. and during World War I served on the General Staff, being awarded the D. S. M. In 1928 and 1930 he was elected lieut. gov. of N. Y. State. In 1932, 1934, 1936, 1938, and 1940 he was elected governor of the State. In 1942 President Roosevelt appointed Mr. Lehman as Director of Foreign Relief and Rehabilitation Operations.

Lehmann, Lilli (1848-1929), German singer. Her reputation was enhanced by her singing in the Nibelungen trilogy at Bayreuth, and she sang Wagnerian parts in London, and in 1885-90 was principal soprano in Wagnerian opera at the Metropolitan Opera House in New York.

Lehmann, Rudolph (1819-1905), German painter. Among his best known pictures, apart from portraits, are *Sixtus V. Blessing the Pontine Marshes*, in the museum at Lille, and *Early Dawn on the Pontine Marshes*. He has published *An Artist's Reminiscences* (1894); *Men and Women of the Century* (1896).

Leibniz (Leibnitz), Gottfried Wilhelm, Freiherr von (1646-1716), German philosopher. In 1672 Leibniz went to Paris, where, in the course of a four years' residence, he had much friendly intercourse with Arnauld, Huygens, Malebranche, and other leading mathematicians and philosophers of the time, and made a profound study of mathematics, which ultimately bore fruit in his discovery of the *Differential Calculus* in 1676 (published 1684). In 1676 Leibniz became librarian to the Duke of Brunswick at Hanover, a post which he held for the remainder of his life. During the Hanover period of his life, Leibniz did most of the work which earned for him the name of 'the greatest polymathist since Aristotle.' He developed his system of metaphysics, which, however, he did not formally publish, but indicated in occasional papers for scientific journals and in correspondence with other thinkers. He wrote the one book which was published in his lifetime, the *Th  odic  e*, a work of great learning, intended to maintain against the argu-

ments of Bayle (of *Dictionary* fame) the harmony of faith and reason, and to 'vindicate the ways of God to man.' He died unhonored by his contemporaries, and it was only in later times that his greatness came to be fully appreciated.

Perhaps the dominant feature of Leibniz's thinking was the effort to incorporate in his philosophy the best elements of earlier thought. He maintained that on the whole the philosophers of the past had been right in what they affirmed, wrong in what they denied. This is the secret of his doctrine, that the universe is ultimately a system of monads or spiritual automata, each being (in dependence only upon God) the cause of all the phenomena which make up its life, each reflecting ('mirroring'), with more or less clearness, the whole universe, and all thus agreeing in a 'pre-established harmony,' which explains the unity of the world, in spite of the diversity which might seem inevitably to result from the perfect spontaneity of each of the monads, its elements. The influence of Leibniz upon later thought has been great, and is especially marked in the philosophies of Herbart, Lotze, and Renouvier. Leibniz was also the first to draw attention to the psychological importance of unconscious or subconscious mental processes and some of his suggestions on biological and physiological questions have been singularly fruitful. Nearly all the chief sciences or branches of learning owe something to his wide curiosity and his pregnant reflection.

Leicester (Saxon *Legerceaster*), borough, England. It is on the site of the Roman *Ratae*, near the Fosse Way. Several churches are ancient; among Roman relics are the Jewry Wall and fragments of Roman pavements; in the neighborhood are the ruins of Leicester Abbey, where Cardinal Wolsey died (1530). Leicester is the center of the hosiery industry of England, and has important manufactures of boots and shoes, elastic web, and agricultural implements; p. 263,000.

Leicester, Robert Dudley, Earl of (?1532-88), favorite of Queen Elizabeth, was fifth son of the Duke of Northumberland. Introduced to court life at an early age, he was the companion of Edward VI. and Princess Elizabeth, and in 1550 married the ill-fated Amy Robsart. With Elizabeth's accession his influence increased. Of gracious presence, a skilled courtier, and held in high favor by the Queen, he was regarded as her

lover. Consult Bekker's *Elizabeth and Leicester*; Richardson's *Lover of Queen Elizabeth* (1907).

Leicestershire, inland co. of England, in the Midlands. The surface is varied, valleys and plains alternating with low hills. Cattle and sheep are reared, and the county has long been noted for wool and Stilton cheese. Oats, wheat, turnips, and mangold are the principal crops. Coal and iron are extensively worked. Manufactures include hosiery, boots and shoes, silk plush, elastic web, bricks, and pottery. Melton Mowbray, Market Harborough, and Loughborough are famous hunting centers.

Leidy, Joseph (1823-91), American naturalist. Leidy made discoveries in palæontology which were of great value as testimony to the newly formulated doctrine of organic evolution. His books include *Cretaceous Reptiles of the United States* (1865); *Treatise on Human Anatomy* (1860); *Fresh Water Rhizopods of North America* (1879); *Researches in Helminthology and Parasitology* (1904).

Leigh, borough, Lancashire, England, has glass works, foundries, and breweries, and manufactures cotton and silk goods and agricultural implements; p. 44,109.

Leighton, Frederic, Baron Leighton of Stretton (1830-96), English historical painter and sculptor. He was 25 when he exhibited his first picture in the Academy (1855), *Cimabue's Madonna Carried in Procession through Florence*, which created a profound sensation in the art world of London, and which was purchased by Queen Victoria. From that year his success was unbroken. Throughout Leighton's art life there was a steadily growing love for those subjects which lent themselves to undramatic and decorative treatment, such as his *Daphnephoria*, *Phryne*, and *The Garden of the Hesperides*. No contemporary draughtsman has excelled him in the drawing and painting of complicated drapery, and in all his work there is to be discerned an absorbing love of beauty. The dignified head of a school, his influence on English art is marked. In addition to his oil paintings, he did fine work in sculpture and in black and white. Among his representative works are *Clytemnestra*; *Helios and Rhodes*; *Phryne at Eleusis*; *Rizpah*; *Cymon and Iphigenia*; *Last Watch of Hero*; *Elijah in the Wilderness*.

Leiningen, a princely house of Germany, dating back to the 11th century. After the

Peace of Luneville (1801) its lands became absorbed in the territories of Baden, Bavaria, and Hesse, and the independence of its princes was lost.

Leinster, eastern province of Ireland, area, 7,619 sq. m. There are few lakes. Its coal field is the most productive in Ireland. The s. part formed the ancient Irish kingdom of Leinster; p. 1,148,911.

Leipzig, or **Leipsic**, division of the republic of Saxony, bordering n. and n.w. on the Prussian province of Saxony; area, 1,377 sq. m. The country is a fertile plain, with only a few mountain ridges in the s. and the e. Agriculture and the rearing of cattle are leading industries; p. 1,307,312.

Leipzig, city, capital of Saxony in Germany. Leipzig is the centre of the music and the book trade and of the fur-dressing industry of Germany, and has an active trade in metals, textiles, paper, furs, pianos, scientific instruments, toys and tobacco. There are important fairs at New Year's, Easter and Michaelmas at which the trade in furs, cloth, glass, and leather amounts to more than \$50,000,000 a year. Of late years, however, these fairs have declined in value. In 1910 a University Exhibition was held in connection with the celebration of the 500th anniversary of Leipzig University; p. 679,322.

Leipzig University, an institution of learning in Leipzig, founded in 1409 with the faculty of theology dominant, now has faculties of theology, law, medicine, natural science, and philosophy, and veterinary and agricultural schools. The university is widely noted for its historical seminaries and is surpassed only by the University of Berlin in the number of foreigners in attendance. It became a state institution in 1830, and in 1909-10 celebrated its 500th anniversary. In 1925 there were 310 professors and teachers and 4,400 students.

Leisler, Jacob (?-1691), provisional lieutenant governor of New York, was born in Germany. He went to New Amsterdam (1660) as a soldier in the service of the Dutch West India Company; held various offices, and was prominent in the political disturbances in New Amsterdam following the accession of William and Mary. Leisler, by popular demand and by free interpretation of despatches received from William and Mary, assumed the position of lieutenant governor and commander-in-chief, and for a brief period directed the affairs of the colony. Leisler and his son-in-law Milbourne were condemned and hanged

May 16, 1691. Consult *Empire State in Three Centuries* (1901).

Leith, important seaport, municipality, and parliamentary borough, Scotland. It has 350 acres of docks and two long piers from which there is a fine view of the Firth of Forth. Leading industries are shipyards, machine shops, flour mills, sugar refineries, breweries, distilleries, and sail-cloth and rope factories.

Leit-motif, ('guiding theme'), in music, the term applied in some forms of composition to distinctive passages or phrases associated with certain prominent ideas, situations, or characters in the work. Wagner in his musical dramas has carried the idea of the *motif* to its highest development.

Leitrim, maritime county in Ireland. The northern part is generally mountainous, with fertile valleys, but the southern part is more open and well suited for cultivation. The Shannon enters the co. n. of Lough Allen, and partly forms the southwestern boundary. Lakes are numerous. Agriculture is the chief industry; p. 55,888.

Leland, Charles Godfrey (1824-1903), American author. He founded and edited the *Continental Magazine* (1861). From 1869 he lived mostly in England. He published two important books on the English Gypsies (1875-1882), but is best known as the author of the diverting *Hans Breitmann's Ballads*, dialect poems in Pennsylvania Dutch-English.

Leland, John (?1506-52), English antiquary, was appointed chaplain and 'king's antiquary' by Henry VIII. (1533), with power to search all cathedrals, abbeys, and colleges for records. He devoted six years to the task, arranging a collection of priceless value to antiquarians. His papers are in the Bodleian and British Museums. Leland's *Itinerary* was first published at Oxford in 9 vols. (1719), and his *Collectanea* in 6 vols. (1715).

Leland Stanford Junior University, a coeducational institution at Palo Alto, Cal., founded in 1885 by Leland Stanford and Jane Lathrop Stanford, and named in memory of their son. The landed endowment of the university consists of two tracts aggregating some 90,000 acres, with various smaller tracts, and the Stanford residence in San Francisco. The buildings, notable for their architecture which reproduces the style of the old California missions, are effectively grouped about an inner and an outer quadrangle. By the terms of the original gift the founders retained full powers in the government of the university, and this led to a period of personal friction which re-

sulted in the resignation of a number of the faculty. Mrs. Stanford in 1903 turned over all the powers to the board of trustees, consisting of 15 members elected for terms of ten years.

Higher degrees are conferred in course, but no honorary degrees are given.

Leleges, ancient people who inhabited the isles of the Ægean Sea and the seaboard of Asia Minor from the River Mæander to the borders of Lycia.

Lelewel, Joachim (1786-1861), Polish historian of German descent. A prominent leader in the Polish revolution (1829), he was banished and died in Brussels. His monumental works on Polish history have been collected and published (1853-76).

Lely, Sir Peter (1618-80), properly Pieter van der Faes, Dutch-English portrait painter. His work reflects the voluptuous temper of the times, and his portraits are painted with a freedom of sentiment and disregard of likeness which make them peculiarly characteristic of the period. They manifest, however, a brilliancy and grace of handling which sometimes recall Van Dyck.

Lemaître, François Elie Jules (1853-1914), French poet, critic and dramatist. He was appointed dramatic critic to the *Journal des Débats*, most of his contributions to that periodical appearing later under the title *Impressions du Théâtre* (10 vols. 1888-95). He published also a series of literary criticisms; two volumes of verse; several plays; the novels *Sérénus*, *Dix Contes*, *Les Rois*, and *Myrrha*; and several critical studies. Lemaître's work is entirely subjective and is characterized by great frankness and unconventionality.

Lemberg, (Polish *Lwow*), city, Poland. It is the seat of three archbishops—Roman Catholic, Greek Catholic, and Armenian, the university with over 100 instructors and 4,000 students, the National Institute, technical high school, Rathaus, Dzieduszycki Museum, containing an important natural history collection, and Skarbek Theatre. Machinery and iron-ware, liquors, beer, leather, matches, and candles, are manufactured, and the city has a considerable trade in agricultural products; p. 318,000.

Lemberg was probably founded about 1250 by the Ruthenian Prince Daniel. It was the capital of a Polish province from 1432 to 1772, when it was given to Austria. In the Great War of Europe Lemberg was invaded by the Russians. Soviet Russia seized Lemberg when Poland was conquered and partitioned in 1939.

Lemercier, Jacques (?1585-1660), French architect, sculptor, and engraver. His buildings are in a modified Italian Renaissance style, the chief ones being the Sorbonne (1629), the Pavillon de l'Horloge, and the churches of St. Roche, Reuil, and Bagnolt.

Lemming, a small yellowish brown rodent, closely related to the vole, and belonging to the genus *Myodes*. The Norwegian lemming is about five inches in length, with the tail extremely short. Special interest attaches to this rodent from the fact that at irregular intervals, varying from five to twenty years, it suddenly appears in vast numbers in Northern Europe; great bodies, said to number millions of individuals, migrate from place to place in search of food, leaving behind them a track of desolation as they eat their way through fields of corn and grass. They show a remarkable persistency both in the act of migration and in the general direction of the movement, and swim without hesitation any bodies of water which may block their path. As, from the contour of the Scandinavian peninsula, they inevitably come eventually to the sea, those which have not perished from over-crowding, from disease, or from the attacks of their enemies, die in attempting to swim across it.

Lemniscate, in general, a curve generated by a point moving so that the product of its distances from two fixed points is the square of half the distance between the points. It is a particular case of the Cassinian oval and resembles a figure 8. The name is also sometimes given to a general class of curves derived from other curves in the way that the above is derived from the equilateral hyperbola.

Lemnos, or **Limnos**, one of the largest islands in the North Ægean Sea. It has an area of about 150 sq. m. The surface is largely mountainous, the hillsides being devoted to grazing sheep and cattle. Grain, tobacco, and fruits grow in the fertile areas in the valleys, and in early times a red earth called *terra Lemnia* was dug from the hills to be used in the treatment of wounds and serpents' bites. The chief port is Kastro or Lemnos, on the western coast, with a population of about 4,000.

Le Moine, Sir James McPherson (1825-1912), Canadian author. He wrote with equal facility in French and English, producing numerous works on ornithology, archæology, and Canadian history, including *L'Ornithologie du Canada* (1860); *Legendary Lore of the Lower St. Lawrence* (1862); *Maple Leaves* (6 vols., 1864); *Quebec Past and Present* (1876); *Canadian Heroines* (1887); *Birds of Quebec*

(1891); *Histoire Archæologie* (1882-90); *Annals of the Port of Quebec* (1901); *Maple Leaves* (1906).

Lemon, the fruit of *Citrus Limonum*, a tree or shrub belonging to the orange group. It is a native of India, but has been naturalized and is now cultivated extensively in many sub-tropical parts of the world, particularly Italy, Spain, and the adjacent islands. In the United States lemons are an important crop of California, and are cultivated to a less extent in Southern Florida.

The lemon may be grown from cuttings, but is usually grafted on sour-orange stock. There are many varieties, among them the Median Lemon, the Pearl Lemon, and the Sweet Lemon. Lemons naturally ripen during the winter season of northern climates, and as the demand is greatest in the summer, the



Lemon Tree-Twig, with Leaves and Flowers.

1, Pistil and part of stamens;
2, fruit.

fruit is gathered when it has attained a standard size, regardless of whether it is green or ripe. If green, it is ripened artificially in 'curing' rooms, which are kept cool and dark. After they are properly ripened, the lemons are stored, graded, wrapped, and packed for the market. Lemons are more expensive to produce than oranges, but their culture is increasing rapidly, and they form a valuable crop.

The juice is much used dietetically and in medicine; while the rind, either fresh or preserved, is valued by the cook and the confectioner. It is the source of lemon oil.

Lemon, Mark (1809-70), English journalist and dramatist. Besides writing many farces and novels, the best of which is *Falkner Lyle*, he contributed to *Household Words*, *Once a Week*, and the *Illustrated London News*. He was one of the founders (1841) and the first editor of *Punch*, with which he was associated until his death. His *Jest Book* (1864) was reissued in 1892.

Lemon Dab, a flat fish found from the Bay of Biscay to Iceland in moderately deep water. It is caught almost entirely by trawlers, and is an important item in European markets.

Lemon Grass, a name given, from their suggestive odor, to several species of *Andropogon*, a handsome, perennial, Asiatic grass, too coarse to serve as fodder, unless very young. It furnishes a lemon-scented yellow essential oil, used in perfumery, and known commercially as citronella oil, and sometimes as 'oil of verbena.'

Lemonnier, Pierre Charles (1715-1799), French astronomer. His activities comprised a series of lunar observations covering 50 years; researches in terrestrial and atmospheric electricity; and the determination of the position of many fixed stars.

Lemon Oil, an essential oil (specific gravity 0.857-0.862) obtained from the rind of lemons. It is a colorless liquid of pungent odor and finds extensive employment in the preparation of the lemon extract commonly used for flavoring purposes. Lemon oil is made from the fruit while in its green state, when the rind contains the largest percentage of oil.

Le Moyne, Charles (1656-1729), French-Canadian soldier, son of Charles Le Moyne. In 1700 he was made governor of Montreal and first Baron de Longueuil for his military services, but was refused the governorship of the colony in 1725 on account of his being a native. In the year of his death, by concession of the hostile Iroquois, he was permitted to rebuild the fort at Niagara.

Le Moyne, Charles Sieur de Longueuil (1626-83), French pioneer in Canada, a native of Normandy. He distinguished himself in the border warfare against the Iroquois and the English. He was ennobled by Louis xv. (1668), and made captain of Montreal.

Le Moyne, Jacques (1659-90), French-Canadian soldier, son of the elder Charles Le Moyne. He was distinguished for his participation in the expedition of De Troye against

the English in 1686, in which he surprised and captured Fort St. Rupert with an inferior force. He took part in the burning of Schenectady (1690), and in the same year repulsed Admiral Phips' attack upon Quebec, falling mortally wounded in the hour of victory.

Le Moyne, Jean Baptiste (1704-88), French sculptor. His work consisted largely of portrait studies—notable among which were a number of bronze statues of Louis xv., which were destroyed during the Revolution. The finest of these were an equestrian statue at Bordeaux, and a monument for the façade of the Hotel de Ville at Rennes. Some of his busts are still in existence, the best being in the Foyer des Artistes in the Théâtre Français.

Le Moyne, Jean Baptiste, Sieur de Bienville (1680-1768), Canadian explorer. In 1699 he accompanied his brother Iberville on an expedition to explore the country near the mouth of the Mississippi. The first settlement was made at Biloxi in May, 1699. In 1713 he was made lieutenant-governor under Cadillac, and in 1718 became governor of Louisiana. In the same year he founded the city of New Orleans. He was removed from office in 1726 and returned to France, where he remained until 1733, when he was returned to Louisiana as lieutenant-general.

Le Moyne, Paul (1663-1704), French-Canadian soldier, son of Charles le Moyne, was one of the most prominent leaders in the defeat of the British troops before Quebec (1690). In 1696 he waged a successful campaign against the Iroquois and forced them to sue for peace.



Ring-tailed Lemur.

Lemur, or Half Ape, a name applied to a considerable group of mammals which appear to stand between the Insectivora and the Monkeys. They range in size from that of a squirrel to a cat. The head is more like that of a fox, with a sharp muzzle. The tail varies widely, and may even be absent, but is never prehensile. The fur is thick and soft. The lemurs are all forest dwellers, arboreal in habit, feeding on leaves, fruit, birds, insects, and

small reptiles. There are some 50 species of lemur-like animals, restricted entirely to the Old World, but fossil remains in Europe and America indicate that the distribution of the animals was formerly much wider. Their abundance in Madagascar is probably due to the absence in that island of large carnivores and higher primates, so that these almost defenceless little animals have not been killed off.

A familiar example of the true lemur is the Ring-Tailed Lemur or 'Madagascar cat,' frequently seen in menageries.

Lena, river in Eastern Siberia, with a drainage area of over 900,000 sq. m. It rises in the mountains about 30 m. w. of Lake Baikal; flows in a northeasterly direction as far as Yakutsk; thence n. and n.w., reaching the Arctic Ocean, after a course of nearly 2,900 m. Polar ice blocks it most of the year.

Lenau, Nikolaus (1802-50), pseudonym of Nikolaus Niemsch von Strehlenau, Hungarian poet. His poems give utterance to his melancholy, and are full of sentiment, of mysterious reverie, and of vague aspirations.

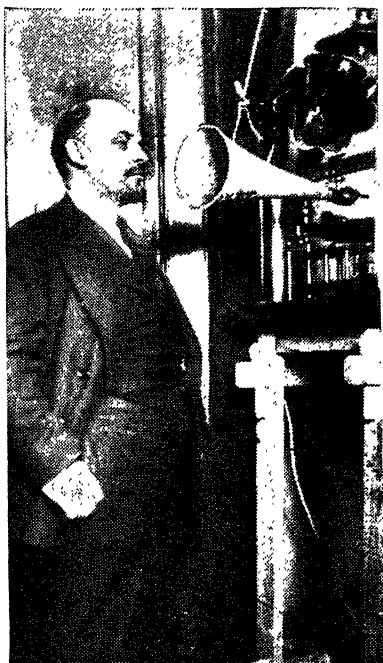
Lenbach, Franz von (1836-1904), German portrait painter. With his early works, *Shepherd Boy* and *Peasants taking Refuge from the Weather*, he paved the way in Germany for the realistic movements.

Lend-Lease Act (H. R. 1776), a White House sponsored law passed by Congress and signed by Pres. F. D. Roosevelt March 11, 1941, providing authority for the President to lend or lease or otherwise deliver and convey under loose title to any or all democracies of the world any military equipment or supplies deemed by the President to be or become necessary for the defense of the United States. By January 1, 1943, the value of lend-lease goods transferred and services rendered to 38 countries had reached \$8,252,733,000. At the resignation of Harry Hopkins, the Act's first Administrator, E. R. Stettinius, Jr., became its Administrator. In 1943 the office of Lend-Lease Administration became a part of the Office of Foreign Economic Administration; in 1945 Pres. Truman announced that with the conclusion of the war Lend-Lease would terminate. The State Department declared that not all of the \$42,000,000,000 lend-lease debt was to be canceled but that settlements with the U. S. were required for goods not used or delivered at the war's end.

L'Enfant, Pierre Charles (1755-1825), Franco-American architect; engineer in the Continental army; performed various public engineering services after the Revolution; and designed the plan of the city of Washington,

and was architect of some of its public buildings.

Lenin, Nikolai (1870-1924), Russian dictator and leader of the Bolshevik movement which overthrew the Kerensky social democratic revolution in Russia in November, 1917, and constructed a working class state upon the ruins of the czarist society. From the shadows of exile and outlawry, Lenin emerged as the proletarian man of destiny amid the chaos of Europe's collapsing thrones. From 1919 until his death he was the principal figure of the revolution. With Leon Trotsky



Nikolai Lenin, at Microphone.

at his side reorganizing the shattered Russian army, Lenin built the proletarian society he had preached in the dark rooms of Siberia and the Socialist halls of London and half dozen Continental cities. His real name was Vladimir Oulianoff. Until his death he worked fearlessly and ruthlessly toward the realization of his theories of communistic government. He was the author of *The Development of Capitalism in Russia: Economic Sketches and Articles*; a translation of Sidney and Beatrice Webb's *Industrial Democracy*, and many pamphlets. See RUSSIA.

Leninograd, new name for Petrograd, Russia, adopted by the Soviet government in

1924, in honor of Lenin, the Soviet leader. See PETROGRAD.

Lennepe, Jacob van (1802-68), Dutch poet and novelist, sometimes known as the 'Walter Scott of Holland,' was born in Amsterdam. While practicing law in Leyden he published many poems and patriotic works, including *Nederlandsche Legendes*, a series of stirring legends in verse, and *De Pleegzoon* (1833), an historical romance. He wrote also several dramatic pieces, and translated from many English poets.

Lennox, Charlotte, nee Ramsay (1720-1804), Anglo-American poet, critic, and writer, was born in New York, and went to England at the age of fifteen. She published poems, novels, and plays, her best-remembered work being a novel entitled *The Female Quixote* (1752), of which Fielding entertained a high opinion. She also published, *Memoirs of Harriet Stuart* (1751); *The Sisters* (1769), and *Old City Manners* (1773)—both comedies; *Euphemia* (1790); *Shakespeare Illustrated* (3 vols. 1753-54), which is discussed by Professor Lounsbury in his *Shakespeare as a Dramatist*.

Lenormant, François (1837-83), French archæologist. He discovered the non Semitic or Akkadian element in the cuneiform inscriptions, and contributed a brilliant defence of the historical value of the early Scriptures in *Les origines de l'histoire d'après la Bible* (1880-82). He also wrote *Histoire des peuples orientaux et de l'Inde* (1869), and *Les antiquités de la Troade* (1876).

Le Nôtre, André (1613-1700) French architect and landscape gardener. He was appointed by Louis XIV. to lay out the park of Versailles, the gardens of the Trianon, Chantilly, Fontainebleau, and St. Cloud, and the terrace at St. Germain. In Rome he laid out the gardens of the Vatican and the Quirinal, and in England St. James' and Kensington Gardens, and the park at Greenwich. See LANDSCAPE GARDENING.

Lenox, town, Massachusetts, Berkshire co., 6 m. s.w. of Pittsfield. It is beautifully situated in the picturesque Berkshire Hills, and is a fashionable summer resort. There are many large estates. It was the home of Nathaniel Hawthorne, Henry Ward Beecher, and Fanny Kemble; p. 2884.

Lenox, James (1800-80), American philanthropist, was born in New York City. He collected, in the United States and Europe, an extensive library and gallery of paintings. These, with a building and grounds costing nearly \$900,000, he presented to the city of

New York in 1870. (See NEW YORK PUBLIC LIBRARY.) He gave largely also to other worthy causes.

Lenox Library. See **New York Public Library.**

Lens, town, France, on the Deule River. It is situated in a rich coal field and has extensive manufacturing interests—iron and steel works, sugar, soap, and wire rope factories; p. 30,100. Lens was occupied by the Germans in the first days of October, 1914, in the West Flanders campaign, and for a time fighting centered about the region just to the w. of the town. The Allies made repeated attempts to recover the town but it was not until after the Allied successes on the Somme, Oise-Aisne, Arras and Ypres fronts and at St. Mihiel in the summer of 1918, that the Germans began to evacuate Lens on Sept. 5. On Oct. 3 the town was in possession of the British.

Lenses are generally discs of glass with one or both of the faces curved, the simple magnifying glass or burning glass being perhaps the most familiar example. When such a lens is held so as to allow the sun's rays or the rays from any other sufficiently distant source of light to pass through it, the rays become concentrated on the farther side of the lens very nearly to a definite point, known as the principal focus of the lens. A lens thus capable of condensing a beam of parallel rays to a definite focus is called a condensing, converging, or convex lens. The other type of lens is the diverging or concave lens. When parallel rays are passed through it they are made to diverge. They cannot, therefore, be brought to a focus on the farther side; but they appear to come from a point on the side next to the source of light, and this point is one of the principal foci of the lens. In both kinds of lenses there are obviously two principal foci, situated at equal distances from the lens on opposite sides of it.

The main properties of lenses may be easily deduced from a few simple experiments. Take, for example, several magnifying glasses of different strengths, place each in turn in the path of a ray of sunlight, and measure the distance from the lens of the position of the principal focus. It will be found that the stronger magnifying glass has the shortest focal length—that is to say, it produces the greatest convergence in the rays which were originally parallel. And generally if we arrange the lenses in order of their magnifying powers, beginning with the strongest, the re-

sult will be the same as if we had arranged them in the order of increasing focal lengths. The less the focal length, the greater the convergence, the more powerful the lens.

No diverging lens can form a real image of a real object nor one which is larger than the object. Lenses whose thickness is considerable fail to function precisely in all respects as indicated above. Special combinations of lenses are used in microscopes, telescopes, opera and field glasses, photographic cameras, and other optical instruments, the practical problem being in all such cases to get a clear-cut image free from color fringes and not appreciably distorted. See ACUROMATISM; MICROSCOPE; PHOTOGRAPHY; TELESCOPE.

Lenses are also of great practical importance for correcting defective vision. See EYE; OPTOMETRY; SPECTACLES.

Lent (A. S. *Lenten*, 'spring'), the great church fast preceding Easter. Originally, it appears to have lasted but forty hours, and until the age of Gregory the Great, it consisted of only thirty-six days of fasting, since the Sundays were omitted, and all the Saturdays except one. It is not certain whether Gregory the Great, or Gregory II., nearly a hundred years later, added Ash Wednesday and the remainder of the week to Lent, which now, saving the Sundays, includes exactly forty days of abstinence. It is observed in the Roman Catholic, Eastern, Anglican and Lutheran churches. See EASTER; GOOD FRIDAY; HOLY WEEK; MAUNDY THURSDAY; PALM SUNDAY; PASSION WEEK.

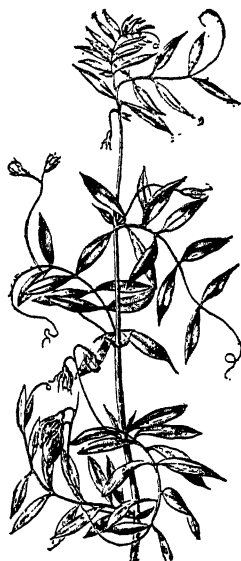
Lentibulariaceæ, a natural order of dicotyledonous plants, most of which are aquatic herbs, having entire radical leaves, or multipartite floating leaves with bladders. The corolla is two-lipped, and the fruit of a many-seeded capsule. Butterworts and bladderworts are the two American genera.

Lentils, the round, flat seeds of a small leguminous plant, of which numerous varieties are cultivated in the countries bordering the Mediterranean and elsewhere. The seeds are highly nitrogenous, and of great food value. The dark-green German lentils are much more palatable than the reddish yellow Egyptian variety.

Lentulus, a patrician family of the Cornelian clan, in ancient Rome, of which the best-known member was Publius Cornelius Lentulus Sura, who was ejected from the senate (70) for his disgraceful life, and joined the conspiracy of Catiline. When Catiline left

Rome (63), Lentulus was head of the conspirators, but was eventually arrested and executed by Cicero.

Leo, an ancient constellation and the fifth sign of the Zodiac. The sun enters it about July 21. The stars in the neck and mane of the asterism form the well-known 'sickle,' the handle being marked by Regulus.



The Lentil Plant.

Leo, the name of thirteen popes. **LEO I.**, St., surnamed the Great (440-61), was born in Rome, and succeeded Sixtus III. He induced Attila to spare Rome during his invasion of Italy, and prevailed on Genseric and the Vandals to exempt the city from incendiarism. With his pontificate began the promulgation of papal letters and decrees. **LEO III.** (795-816) crowned Charlemagne in Rome, and in return was established as temporal sovereign over the Roman states, subject to the suzerainty of the emperor. **LEO IX.** (1048-54) was a native of Alsace, of the name of Bruno. His first Easter synod enjoined the celibacy of the clergy, and throughout his pontificate he expressed strong convictions adverse to simony and incontinence. **LEO X.** (1513-21), Giovanni de' Medici, was born in Florence, second son of Lorenzo the Magnificent, and was elected Pope at thirty-six (1513). He had been created cardinal in 1488, when but thirteen years of age. During the seven years of his papacy, he made Rome the center of the world in art

and scholarship, as well as in religion. **LEO XIII.** (1878-1902), son of Count Pecci and 258th Roman pontiff, was born at Carpineto in 1810. On the death of Pius IX. (1877), he was chosen Pope (1878). He showed himself a pontiff of enlightened views, while his foreign policy was characterized by foresight and moderation. He restored the hierarchy to Scotland, settled the religious difficulty with Germany, and denounced in general terms the methods of the 'plan of campaign' in Ireland (1888). A man of wide culture, he wrote Latin verse of a high order; while in his encyclicals he strongly upheld the supreme power and influence of the papacy.

LEO I., Flavius (400-474), Byzantine emperor, native of Thrace, was the first emperor of Constantinople crowned by a bishop.

LEO III. (c. 680-741), called 'The Isaurian,' emperor of Constantinople. In 734 he transferred Greece, Macedonia, and Illyria to the patriarchate of Constantinople, thus initiating the separation between the Greek and Roman churches. He is best remembered for his efforts to end image worship.

LEO, Leonardo (c. 1694-1746), Italian composer, studied at Naples and Rome, returning in 1717 to the former city to become choirmaster and director of the musical school of San Onofrio. His sacred music includes his celebrated *Miserere*.

LEO AFRICANUS, Berber traveller and geographer, who, toward the end of the 15th century, travelled through Western Asia and Northern and Central Africa. His account of his travels, written in Italian and published by Ramusio (1550), was for long the chief source of information on the Sudan.

LEOBEN, town, Austria. It is in a rich mining district and has an excellent college of mining. There are deposits of lignite near by, and manufactures include leather goods and dyes; p. 10,858.

LEOBSCHÜTZ, town, Upper Silesia, Germany, on the Zinna; 20 m. n.w. of Ratibor. Manufactures include woolen goods, glass, machinery, linen, beer; p. 13,000.

LEOCHARES, (fl. 352-338 B.C.), famous Greek sculptor of the later classic school, a contemporary of Scopas and Praxiteles. He was employed by Philip II. to execute the portrait statues of himself, Alexander, Amyntas, Olympias, and Eurydice, played in the *Philippeum* at Olympia. A copy of his masterpiece, *Ganymede carried off by the Eagle of Zeus*, is in the Vatican at Rome.

LEO MINOR, a small constellation between Leo and Ursa Major. The chief star, 46 Le-

onis Minoris, is of the fourth magnitude and of solar type.

León, province, Ecuador, centrally situated in the Andes, with an area of 2,595 sq. m. Cotopaxi is on the northern boundary; p. 110,000.

León, town, Mexico. The principal buildings are the cathedral, the municipal palace, and the church of the Immaculate Heart of Mary. Copper and silver are worked in the neighborhood, and leather goods, cutlery, and straw hats are manufactured; p. 57,722.

León, largest town and former capital of Nicaragua, Central America, stands on a fine plain near the Pacific Coast. It has a large trade in the products of the region; p. 38,318.

León, city, Spain, capital of the province of León, is situated in a fertile plain at the confluence of the Torio and the Bernesga; 77 m. n.w. of Palencia. It has a fine Gothic cathedral dating from the 13th century. The celebrated church of St. Isidore, of Byzantine architecture, contains the remains of royal tombs, and the convent of San Marcos, a part of which contains an archæological museum, has a beautiful façade; p. 18,117.

Leonardo da Vinci, (1452-1519), Italian painter, head of the Umbrian Lombard School, famous also as a sculptor, architect, musician, poet, engineer, mathematician, and philosopher, was born in Vinci, the illegitimate son of a Florentine notary. Before entering upon the study of painting he took up mechanical engineering, in which he became proficient. He devoted much time to study and research concerning the science of flying though he seems to have made no actual experiments in flight. About 1483, he went to Milan. To his Milanese period are ascribed the artist's most celebrated production, the two versions of *Our Lady of the Rocks* (Louvre and National Gallery), and *The Last Supper* (Milan.) He also founded an academy of arts, for which he wrote *Notes for a Treatise on Painting*. In 1504 he painted the famous *Mona Lisa*, which was stolen from the Louvre in 1911 and two years later was found in Florence and restored. Leonardo da Vinci was a man of extraordinary physical beauty and strength, whose endless invention, curiosity in science, and ceaseless quest after the ideal and the marvelous must account for the small number of pictures finished by him. His *Last Supper*, painted on the refectory wall in the monastery Santa Maria delle Grazie (Milan), even in its present faded state, is one of the masterpieces of the world; while in his *Mona Lisa*

he created a symbolic type of ideal female beauty, that has haunted and perplexed succeeding generations.

Leoncavallo, Ruggiero (1858-1919), Italian composer. The influence of a personal acquaintance with Wagner led him to write his own libretto for *I Pagliacci* (Milan, 1892), which has closely matched Mascagni's *Cavalleria Rusticana* in quality and success. *Chatterton*, a failure at first, won more favor when rewritten in 1896. Other works are *Medici* (1893), *La Bohème* (1897), *Zaza* (1900), *Roland von Berlin* (1904), *Maia* (1910), and *Malbrück* (1910).

Leonidas, in ancient Greek history, the famous Spartan who commanded and died at Thermopylæ. He was king at Sparta from 491 to 480 B.C., and in the latter year went to hold the pass of Thermopylæ against the forces of Xerxes, with only 300 Spartans and 5,000 allies. For two days Leonidas and his soldiers held the pass against the flower of the Persian army, but the following night they were betrayed to the enemy and fell to a man.

Leonid Meteors, a swarm of minute bodies revolving round the sun in 33¼ years, and crossing the earth's orbit at the point traversed by it about November 15. Hence arises a periodical shower of falling stars, called Leonids, because they appear to diverge from a small sky area near Leonis. The Leonids are characterized by their swiftness, their greenish tint, and their persistent trains. Being retrograde travellers, they meet us with a velocity of forty-four miles a second. The first authentic notice of a Leonid display was in 902, brilliant recurrences being observed in 1202 and 1366, in 1799 by Humboldt at Cumana, and universally on Nov. 12, 1833. The periodicity of the phenomenon was then recognized, and the prediction of its conspicuous visibility on Nov. 13, 1866, obtained full verification. Dr Millman, of the University of Toronto, believes that the brilliant displays of Leonid meteors have disappeared and will not come back. From observations made in November, 1934, Dr. Millman reported only 100 meteors an hour, compared with 900 an hour in 1901 and about 1,000 an hour in 1866.

Leonine Verse, a popular mediæval form of Latin verse, in which the syllables immediately preceding the cæsura of a line rhyme with the final syllables—'En rex Eduardus, debacchans ut leopardus.' Strictly speaking, only elegiac verse (alternate hexameters and pentameters), as in Bernard of Morlaix's *De*

Contemptu Mundi, can be termed leonine.

Leonnatus, a Macedonian of Pella, and one of the principal officers of Alexander the Great, having previously served as one of the bodyguards of Philip.

Leontotis, a genus of shrubs and herbs belonging to the order Labiatae, natives of tropical or subtropical regions.

Leon Pinelo, Antonio de (c. 1590-1675). Spanish lawyer and author, born at Cordoba, Argentina. Leon Pinelo was judge of the tribunal of the Casa de Contratacion at Seville, and was appointed royal historiographer (1637).

Leontodon, a genus of composite-flowering plants with dentately-lobed leaves, the lobes pointing backward, an involucre imbricated with scales, a flattened fruit with a long beak, and a hairy white pappus.

Leontopodium, or **Lion's Foot**, a genus of herbaceous plants belonging to the order Compositae. They bear dense cymes of flowers at the summits of the branches, and all are hairy or woolly plants.

Leopard (*Felis pardus*), a carnivore closely allied to the lion and the tiger, but differing in its inferior size, and in the fact that its tawny coat is covered with dark spots, formed by an incomplete ring of black enclosing a bright central patch. In addition to this brightly-colored form, there exists also the black leopard or panther, formerly regarded as a distinct species, but now proved to be merely a variety. They are very active animals, and differ from lions and tigers in that they habitually climb trees. The total length, including the tail, is sometimes as much as eight feet.



Leopard.

Leopardi, Count Giacomo (1798-1837), Italian writer, born at Recanati, of a noble but impoverished family; was a cripple through life. He devoted his youth to a close study of the classics and became one of the most brilliant scholars and poets of the day.

Leopold I. (1640-1705), Holy Roman emperor, son of Ferdinand III., became king of Hungary (1655), and king of Bohemia (1657). Elected emperor (1658). In 1701

Leopold claimed the crown of Spain for his son Charles, and thus initiated the war of the Spanish Succession, which was continued under his successors Joseph I. and Charles VI.

Leopold II. (1747-92), Holy Roman emperor, third son of Francis I. and Maria Theresa, became grand-duke of Tuscany (1765), and succeeded his brother, Joseph II., as emperor (1790). In 1792 he concluded an alliance with Prussia for the restoration of Louis XVI. of France, but died just as hostilities were about to begin.

Leopold I., George Christian Frederic (1790-1865), king of the Belgians, son of Francis, Duke of Saxe-Coburg. Prince Leopold visited England in 1815, and the following year married the Princess Charlotte, daughter of George IV., was naturalized, created Duke of Kendal, and made a general in the British army. The princess died in 1817. In 1830 he declined the crown of Greece, and in 1831 he was elected first king of the Belgians. In 1832 he married Louise, daughter of Louis Philippe. He bore the title 'Juge de Paix de l'Europe' for his good offices as umpire in international disputes.

Leopold II., Louis Philippe Marie Victor (1835-1909), king of the Belgians, was born at Brussels, and succeeded his father, Leopold I., Dec. 10, 1865. He was the virtual proprietor of the Congo Free State with its thirty millions of people and immense resources. Reports of atrocities committed upon the natives of the Congo under his administration aroused the protest of the civilized world. At his death, these charges and condemnation of his private life overshadowed the many improvements that he had established in Belgium. In 1853 he married the Archduchess Marie Henriette Anne of Austria, and by her had four children.

Leopold III (1901-), king of the Belgians (1934-). He married Swedish Princess Astrid in 1926 and by her had three children. The queen was killed in an automobile accident in 1935. When the Belgian army surrendered to Germany in 1940, King Leopold was interned at Laeken, Belgium; in 1945 was told by the Belgian Parliament he could not return, but the Swiss Government permitted him to enter their country.

Leotychides, king of Sparta, reigned from 491 to 469 B.C. He commanded the Greek fleet against the Persians, and won the battle of Mycale (479).

Leovigild, Lowenheld (d. 586), king of the Visigoths in Spain from 569.

Lepanthes, a genus of tropical epiphytal

orchids, of which the West Indian *L. sanguinea*, with red flowers, and the New Granada *L. calodictyon*, with small orange and red flowers, are the best-known species.

Lepanto, Greek seaport, on the north shore of the entrance to the Gulf of Corinth or Lepanto. Here, on Oct. 7, 1571, Don John of Austria, commanding the allied fleet of Austria, the Italian States, and Spain, encountered a powerful Turkish fleet under Ali Pasha, which he completely defeated, thereby releasing about 15,000 Christian galley slaves.

Lepanto-Amburayan, sub-province, Luzon, Philippines, in the north central region, with an area of 1,034 sq. m. Cervantes, the capital, is 260 m. n. of Manila.

Lepidium, a genus of plants of the Cruciferae, of which the Garden Cress and Peppergrass are familiar species.

Lepidodendron, the generic name of a large and important group of plants which flourished principally in the Carboniferous period. They belonged to the Lycopodiaceae, and have their nearest representatives in the diminutive club-mosses.

Lepidolite, a variety of mica, one of the chief sources of lithium.

Lepidoptera, (*lepis*, 'scale;' *pteron*, 'wing'), an order of insects which includes the butterflies and moths. Insects of this order have four wings, and both they and the body are covered with scales.

Lepidosiren, one of the three living genera of Dipnoi or lung fishes.

Lepidus, the name of a distinguished family of the Æmilian clan in ancient Rome, of patrician rank. MARCUS ÆMILUS LEPIDUS was prætor in Sicily (81 B.C.), and consul (78 B.C.). Subsequently the senate ordered Lepidus to retire to his province of Further Gaul; but he remained in Etruria, collected an army, and marched on Rome. He was defeated in the Campus Martius by Pompey and Catulus.

MARCUS ÆMILUS LEPIDUS, one of the triumvirs with Augustus and Antony, a son of the above. In 43 B.C., Antony, after his defeat at Mutina, took refuge with Lepidus, when they together crossed the Alps at the head of a strong army, and were joined by Octavian (Augustus), whom the senate expected to oppose them.

Le Play, Pierre Guillaume Frédéric (1806-82), French economist, was born in La Rivière Saint Sauveur in the Calvados. Napoleon III. appointed him to organize the exhibition of 1855. He is regarded in France as the founder of social economy.

Lepontine Alps, that portion of the main chain of the Alps included between the Simplon Pass on the west and the Splügen Pass on the east. Some of the more important peaks and passes, with their height in feet, are as follows:

Simplon Pass	6,595	St. Gothard
Mt. Leone	11,696	Pass
		6,936
Mt. Basodino	10,749	San Bernardino
See ALPS.	Pass	6,770

Leprosy (Gr. *lepros*, 'scaly' or 'rough'), a mildly communicable, more or less chronic systemic disease caused by the *Bacillus lepræ*, and characterized by nodules or tubercles on the skin, or by anæsthetic changes in the nerves. Leprosy is probably communicated only by close contact, most frequently under unhygienic conditions. The incubation period is very long—being estimated at from one to ten years. Clinically two forms of the disease are recognized: (1) the nodular, and (2) the anæsthetic. The average length of life in the anæsthetic type is ten to twenty years as compared to five to ten years in the other form.

For centuries leprosy has been regarded as an incurable disease. Recently, however, remarkable results have been observed with preparations of chaulmoogra oil, obtained from an East Indian tree, *Gynocardia odorata*. This oil has been used since ancient times in India but is extremely nauseating. Intramuscular injections of the oil combined with camphor and resorcin were used with success by V. G. Heiser in 1913-14 and in 1917 Sir Leonard Rogers, working in India, reported encouraging results with a preparation of the sodium salt of the fatty acids of chaulmoogra oil—sodium gynocardate. In 1920 MacDonald and Dean used the ethyl esters of the fatty acids of chaulmoogra oil in the Kalihi Hospital, Hawaii, and their results were confirmed by other workers. With both the Rogers preparation and the ethyl esters, some cases of leprosy have been 'apparently cured,' and many others relieved of their most distressing symptoms.

The first leper home in the United States was established by Louisiana in 1894, near Carville, about 60 miles from New Orleans. Massachusetts has a leper colony at Penikese Island, in Buzzard's Bay, and California has an Isolation Hospital for lepers in San Francisco. The United States has done special work, also, in Guam and the Philippines and in the Hawaiian Islands. The most celebrated leper colony in the world is that at Molokai, Hawaii, established in 1866.

Leptis. (1) MAGNA, or NEAPOLIS, the modern Lebda, seapt., n. coast of Tripoli, Africa. It was a Phœnician colony, and possessed a flourishing commerce. (2.) L. MINOR, city in N. Africa, a little n. of the ancient Thapsus in Tunis.

Leptospermum, a genus of half-hardy shrubs, order Myrtaceæ, natives of Australasia. The leaves of *L. lanigerum* were used by the early settlers in Tasmania as a substitute for tea leaves.

Lepus, an ancient constellation situated beneath the feet of Orion.

Le Queux, William (1864-1927), English novelist, born in London. Among his numerous novels are *Strange Tales of a Nihilist* (1890); *The Great White Queen* (1896); *England's Peril* (1899); *Secrets of the Foreign Office* (1903); *The Mask* (1904); *The Czar's Spy* (1905); *Who Giveth this Woman?* (1905); and *A Spider's Eye* (1905).

Lerdo de Tejada, Sebastian (1825-89), a president of Mexico, was born at Jalapa. He had the portfolio of foreign affairs for a few months (1857) under President Comonfort. He declined to intercede with Juarez for Maximilian; in 1867 was minister of foreign relations and then chief justice of the supreme court, by virtue of which office he became president upon the death of Juarez (July 18, 1872), and in Nov. of that year was formally elected, taking office Dec. 1. His candidacy for re-election in 1876 brought about the revolution of that year. Lerdo made his way to N. Y. City, where he afterward lived in retirement.

Lérida. (1.) Province, Spain, in s. part of principality of Catalonia. Area, about 4,770 sq. m.; p. 300,000 (2.) (Anc. *Ilerda*), cap. of above prov., on the Segre R.

Lérins, Iles de, group of isls. in the Mediterranean, about 2 m off the s. coast of dep. Alpes-Maritimes, France, comprising Sainte-Marguerite, Saint-Honorat, and other smaller islands.

Lermontoff, Mikhail Yurevitch (1814-41), Russian poet and novelist, of Scottish descent, born at Moscow; became an officer in the Russian army. The death of Pushkin inspired his first poem. The best edition of his works is that published by Viskovatoff (1891).

Leros, is. in the Sporades, Ægean Sea, 32 m. s. of Samos, belonging to Turkey; has white marble quarries. Chief town, Marina or Leros. Area, about 25 sq. m.; p. 4,000.

Leroux, Henri or Hugues (1860-1925), French journalist and novelist, born at

Savre. He was interested in social subjects, and his articles in *Le Temps* and *Le Journal*, as well as his various novels, display an intimate knowledge of the life of the 'submerged tenth.'

Leroy, vil., Genesee co., N. Y. It has manufactures of farm implements, flour, and patent medicines; p. 4,423.

Leroy-Beaulieu, Henri Jean Baptiste Anatole (1842-1912). French publicist, born at Lisieux. His *Essai sur la Restauration de nos Monuments historiques devant l'Art et devant le Budget* (1866) was followed by *L'Empire des Tsars et les Russes* (1881-9); *La France La Russie et l'Europe* (1888); *La Révolution et le Libéralisme* (1890); and *La Papauté, le Socialisme et la Démocratie* (1893). In 1881 he became professor of modern history at the Ecole Libre des Sciences Politiques.

Leroy-Beaulieu, Pierre Paul (1843-1916), French political economist, brother of the preceding, born at Saumur. Leroy-Beaulieu became the leading free-trade exponent in France, and founded the *Economiste Français* (1873) to give utterance to his views.

Lesage, Alain-René (1668-1747), French author, was born at Sarzeau, in Brittany. Lesage may be called the first French 'man of letters,' in the modern sense of the term. He resembled the writers of the 17th century, with whom he had much more in common than with Voltaire and his set. Lesage wrote two novels of note and merit—*Le Diable bêteux*, and *Gil Blas*; also one play, *Turcaret*. His other works have fallen into merited oblivion.

Leschenaultia, a genus of Australian herbs and shrubs, order Goodeniaceæ. *L. biloba* bears beautiful corymbs of blue flowers; *L. formosa*, solitary scarlet flowers; *L. linarioides*, yellow flowers; and *L. chloranthes*, solitary greenish flowers.

Lescot, Pierre (c. 1510-78), famous French architect. His plans for the Louvre were carried out by himself and his friend, the sculptor Jean Goujon (1540-8). See Palustre's *La Renaissance en France* (1880).

Lesghians, one of the names (Lesghs, Lezhghines, Leks, and Lek) applied to the collection of petty tribes which, along with the Tchechenzes, inhabit Daghestan ('Highlands') in the Caucasus. They are a people of fine features and physiques, even for Caucasians, of high intelligence, and industrious. The capture of their famous leader Shamyl, in 1859, brought their independence to an

end. In religion they are Mohammedan Sunnites.

Leslie, Alexander, First Earl of Leven (?1580-1661), Scottish general. He joined the army of Gustavus Adolphus as a common soldier, and rose to be lieutenant-general some time before 1626, when he was made a knight. During the Thirty Years' war he held the chief command under Gustavus. In 1644 he was appointed general of the Scottish army sent to the support of the English Parliament. Some time afterwards he successfully stormed Newcastle; and after the capture of Charles (1646), he retained him there until his delivery to the English Parliament (1647). He served as a volunteer against Cromwell at Dunbar (1650), and was afterwards captured by General Monck (1651), and confined for some time in the Tower.

Leslie, Charles Robert (1794-1859), English painter, of American descent, born in London. His *Sir Roger de Coverley going to Church* (1819), the first of his great series of drama-pictures, ensured his election as A. R. A., and full honors followed (1826). He provided the illustrations for Irving's *Knickerbocker History of New York* and the *Sketch Book*.

Leslie, David, Lord Newark (d. 1682), Scottish general, served under Gustavus Adolphus, but returned to Scotland to aid the Covenanters against Charles I. In 1645, by a rapid movement, he surprised and almost annihilated the forces of Montrose at Philiphaugh; and it was to him that Montrose owed his defeat and capture. For some time he completely out-manœuvred Cromwell, and though his march on London ended in overwhelming defeat at Worcester, he did at least the best he could for a cause that had become hopeless. After Worcester he was detained a prisoner in the Tower until the Restoration.

Leslie, or Lesley, John (1527-96), Scotch prelate, statesman, and historian. He for some time represented the interests of Mary at the court of Rome, whence he was sent by the Pope on various missions on her behalf. Leslie is now best known by his histories of Scotland: that in the vernacular, from the death of James I. to 1561, written for Queen Mary's perusal, and printed by the Bannatyne Club (1830); and the Latin history, entitled *De Origine, Moribus, et Rebus Gestis Scotorum* (1578), the most valuable portion of which is the contemporary description of Scotland and its inhabitants.

See *Letters of Mary Queen of Scots*, edited by Labanoff (1839); Irving's *Lives of Scottish Authors* (1801); Father Cody's Introduction to the Scottish translation of Leslie's *Latin History* (Scottish Text Society, 1888).

Lesseps, Ferdinand, Vicomte de (1805-94), French diplomat. In 1854 he evolved the Suez Canal scheme, which, on account of British opposition to the work, was not begun till 1860. The canal was finished in 1869. For this he received the Grand Cross of the Legion of Honor and an English knighthood. In 1881 he began the Panama Canal on insufficient funds, and in 1892 the management was charged with fraud, and De Lesseps was condemned to five years' imprisonment, but was too ill to undergo the sentence.

Lessing, Gotthold Ephraim (1729-81), German critic and dramatist, born at Kamenz, Upper Lusatia. In 1755 he published his first important drama, *Miss Sara Sampson*. In 1767 he published *Minna von Barnhelm*, the first of all German comedies, and still without a rival. Lessing, who had failed to obtain the post of librarian to Frederick the Great, accepted an invitation to Hamburg, where he was to direct and elevate the theatre. His criticisms of the actors and of the plays performed were collected under the title of *Hamburgische Dramaturgie* (1768-9). His knowledge of classical antiquity and scholarly methods were apparent in the *Briefe antiquarischen Inhalts* (1768) and the beautiful essay *Wie die Alten den Tod gebildet*. He next went to the little town of Wolfenbüttel as librarian to the Duke of Brunswick (1770), and wrote his fine tragedy *Emilia Galotti* (1772). In 1780 he summed up his views on the progressive character of religion in mankind in *Die Erziehung des Menschengeschlechts*, a fitting conclusion to his strenuous lifework. Lessing's grand sincerity and independence of character, and the unique combination of critical and creative powers seen in his works, make him the greatest German writer since Luther, and to many he is still one of the world's great leaders. A considerable literature has grown up around him and his works. These were edited by K. Lachmann (re-edited by Fr. Muncker) in 15 vols. (1886-1900). See biographies by Danzel and Guhrauer (1850-4), in English—Sime (1877), Helen Zimmern (1878), and Rolleston (1889).

Lesson, or Lection, a portion of holy Scripture or other religious matter read at divine service. The word is principally applied to the part of the Old Testament termed

'the second lesson,' set down in the English and American Prayer Books to be read at morning and evening prayer.

Lethe, in ancient Greek mythology, the river in the lower world from which departed spirits drank to obtain forgetfulness of the past; the name itself means forgetfulness.

Leto, called Latona by the Romans, was, in ancient mythology, a daughter of the Titan Cœus and Phœbe. Zeus loved her, and by him she became the mother of Apollo and Artemis. She was generally worshipped in conjunction with her children.

Letters, or epistolary writing, may be regarded as constituting in the main one of the most attractive forms of literature. Some of the most delightful correspondence comes from the pens of people who are not in the ordinary sense, literary at all. The genuine nature of the writer comes out conspicuously under such conditions; as in the artless effusion of James VI. of Scotland, written from the court of Denmark. This ingenuous frankness is also apparent in the celebrated collection known as *The Paston Letters* (ed. by Gairdner, 1904). Besides throwing considerable light upon historical matters and English life during the reigns of Henry VI., Edward IV., and Richard III., they are alive with the personal element which is the chief attraction of unstudied correspondence. The *Letters of Jane Welsh Carlyle* (1883, 1889) and the *Vailima Letters* (1895) of R. L. Stevenson may be named as two of the most interesting collections of recent times in the English language. The epistolary form has been frequently selected as a vehicle for didactic and political purposes. For example, the religious teaching of the early Christian apostles, as preserved at the present day, is for the most part conveyed in this shape.

Letters of Marque, a commission issued by a government, authorizing masters of merchant ships, privateers, and others to capture prizes and property on the high seas or in harbor, by way of reprisals for damage done. By the Declaration of Paris, the granting of letters of marque was forbidden. The U. S. Congress is given power by the Constitution to grant letters of marque and reprisal. See DECLARATION OF PARIS; also Hall's *International Law* (5th ed. 1904), and Wheaton's *International Law* (4th ed. 1904).

Letter-wood, the mottled brown heartwood of *Brossimum Aubletii*, a tree native to British Guiana. It is used as a veneer, and is also known as 'snake-wood.'

Lettres de Cachet. In France, before the

revolution, the king had power to issue sealed letters to governors of prisons and others, authorizing them to arrest and detain the persons named therein. They were extensively employed by Richelieu, Mazarin, and Louis XVI., both for purposes of state and for private ends, and were abolished by the National Assembly (1789).

Letts. See Livonia.

Lettuce, an annual plant *Lactuca scariolo* (*sativa*), a native of Eastern and Central Asia, and Southern Europe. It has long been cultivated as a salad plant, and was grown by the ancient Greeks and Romans for this purpose. By careful treatment and selection of varieties, lettuces may be grown in the open air most of the year. There are two



Lettuce.

1, Cabbage lettuce; 2, cos lettuce.

great classes, 'cabbage lettuces' and 'cos lettuces'—the former being distinguished by their broad leaves and low, spreading habit; the latter by their upright habit, and the oblong form of their leaves.

Leucadendron, a genus of S. African trees and shrubs, order Proteaceæ. The best known species is *L. argenteum*, the silvertree or wittebroom, with its beautiful, long, silvery-white leaves, well worth cultivation.

Leucippus, a Greek philosopher, who probably flourished about the middle of the 5th century B.C. He is said to have invented the atomic theory expounded by his pupil Democritus.

Leucite, potassium and aluminum silicate found in the lavas of Vesuvius, in which it forms white or ash-gray, rounded, many-faceted crystals, mostly embedded in a black crystalline rock. Leucite is interesting to the mineralogist because of its apparently anomalous structure and optical properties.

Leucocrinum, the sand lily of Colorado, is a liliaceous genus containing the one species *L. montanum*. This is a dwarf-growing, hardy plant, bearing, close to the ground, clusters of white, funnel-shaped, fragrant flowers in early spring.

Leucocythæmia, or **Leukæmia**, is a disease characterized by great increase in the number of white corpuscles present in the blood, and generally by some decrease in the red corpuscles. Two forms are recognized, one known as the myelogenous type. The other form is the lymphatic.

Leucoium, or **Snowflake**, a genus of hardy, bulbous plants, order Amaryllidaceæ. They have usually long, narrow leaves, and pendulous white flowers, remotely like those of the snowdrop.

Leucoma, or **Albugo** (Gr. *leukos*, 'white'), is an exceedingly dense white cicatrix which sometimes follows deep ulceration of the cornea. When situated near the center of the pupil, it seriously impairs the vision of the affected eye.

Leucopogon, a genus of tropical and sub-tropical evergreen shrubs, order Epacridactæ. They bear terminal axillary spikes of small white flowers.

Leuctra, small tn. in Bœotia, ancient Greece, famous for the great victory gained in its neighborhood by the Thebans over the Spartans (371 B.C.), which practically ended Spartan supremacy in Greece.

Leukas, or **Leucadia**, now called Santa Maura, isl. in the Ionian Sea, off the coast of Acarnania, in W. Greece, 46 m. s.e. of Corfu. The chief products are currants, wine, and oil. Its capital is Amaxichi or Leukas, on the n.e. coast. Its name 'Whiteland' is due to the chalky nature of its hills, the highest of which attain to an elevation of 3,700 ft. Colonized by Corinthians about 650 B.C., they made it an island by cutting a canal through the narrow isthmus which connected it with the mainland.

Leutze, Emanuel (1816-68), German-American historical painter, born at Gmünd, Württemberg, and studied art in Düsseldorf, making his home there until 1859, when he went to the U. S., where he received a commission to paint *Westward the Star of Em-*

pire takes its Way (1860) for the capitol at Washington. Among his other works are *Columbus before the Council at Salamanca* (1841), and his *chef-d'œuvre*, *Washington Crossing the Delaware*.

Levant, a name first applied by the Italians to the Mediterranean Sea and the regions adjoining it to the e. of Italy. It now refers to the east end of the Mediterranean and the adjoining countries, whose inhabitants are called Levantines.

Levee. See **Mississippi River**. *Protective Works*.

Level. (1.) An instrument for obtaining the direction of a line parallel to the horizon, or testing the horizontality of surfaces. It depends in its various forms on the principle that the surface of a liquid at rest is horizontal. The water-level is the simplest variety of the instrument. Instruments based on the spirit-level are, however, much more accurate and convenient. In levelling for surveying purposes, the spirit-level is fixed parallel to the axis of a telescope provided with cross hairs, and the latter directed to a vertical measure, or levelling rod, held first in one position and then in another, the difference of the readings observed on the staff giving the difference of level between the two points. See **SURVEYING**; **THEODOLITE**. (2.) A level in mining is a horizontal gallery run to connect shafts and to open the ground. See **MINING**.

Levelling. A surveying operation involving the determination of different points or objects at or near the earth's surface, as in the construction of railways, mines and tunnels. Levelling is usually carried on with a level of one of the forms described above, or by the use of some form of hypsometrical apparatus. See **SURVEYING**.

Levellers, the name of an ultra-republican party in England during the Civil War which was powerful in Parliament in the earlier years of the commonwealth. Dissatisfied with the form of government established by the Parliamentarians after the death of Charles 1., they broke out, in 1649, into open mutiny, but were suppressed by Fairfax.

Leven. (1.) Loch, Kinross-shire, Scotland, 9 m. n.w. of Kirkcaldy, and overlooked by the hills of Benarty and West Lomond. It contains seven islands, of which St. Serf's, the largest, has ruins of an 8th century priory; and Castle Island bears the ruins of the castle in which Mary Queen of Scots was imprisoned (1567-8). See Burns-Begg's *History of Loch Leven Castle* (1877). (2.) Loch, branching e. from Loch Linnhe, and forming

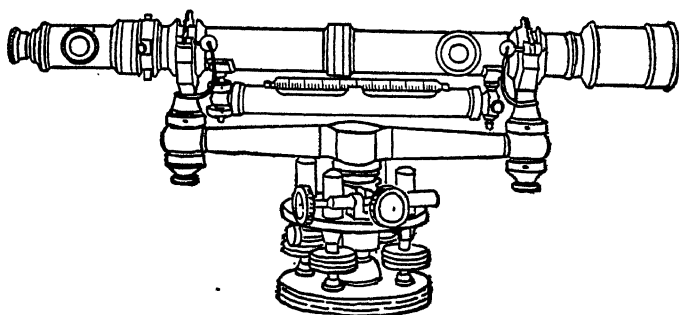
the boundary for $11\frac{3}{4}$ m. between Argyllshire and Inverness-shire, Scotland. The Leven flows in at its eastern extremity. To the s. lie the wild and romantic valley of Glencoe and the great slate quarries of Ballachulish.

Lever, one of the simple mechanical powers. It consists of a rigid rod or frame, one point of which, known as the fulcrum, is fixed in position. A force or pressure applied at some one point can always be balanced by an appropriate force or pressure applied at another point. The balance in its various forms is a lever; but perhaps the most typical example is the crowbar, by means of which large weights are overcome by use of com-

Leviathan, an aquatic monster mentioned several times in the Bible. Its description as given in Job best fits the crocodile.

Levites, members of the tribe of Levi, son of Jacob, especially descendants of Levi. They acted as assistants to the priests in the service of the sanctuary.

Leviticus, the third book of the Bible, derives its name through Latin, from the Greek *Leuitikon*, its Hebrew title being *Wayyikra* 'And he said,' its opening word. It is almost entirely concerned with the ritual of the Levitical system, and has been aptly called the literary monument of the Hebrew priesthood. The law of holiness is the oldest por-



Surveyor's Level.

paratively small forces. There are many forms of simple machines which come under the category of levers, such, for example, as scissors, nut-crackers, tongs, forceps, pincers, pump-handles, the two-pronged head of a hammer when used for drawing out nails, and so on. It will be noticed that there is no necessity for the fulcrum to be between the power and weight.

Lever, Charles James (1806-72), Irish novelist, born at Dublin. His first two novels, *Harry Lorrequer* (1839) and *Charles O'Malley* (1841), appeared as serials in the *Dublin University Magazine*. In 1842 he became editor of the magazine, and from that time till 1872 he published novels in rapid succession. His books are brilliant sketches of Irish life and character. A complete edition of his works (37 vols.) was issued by his daughter (1897-9). See *Life* by Fitzpatrick (1879).

Leverhulme, William Hesketh Lever, First Viscount (1851-1925), English capitalist, developed a soap business of great proportions. He built a model industrial village, Port Sunlight, and instituted a system admitting employees as copartners.

Levi. See **Levites**.

tion, and forms one of the three great legal codes of the Hebrews.

Levulose. See **Fructose**.

Lewes, munic. bor. and co. tn., Sussex, England. At Lewes was fought (1264) the battle in which Henry III. was defeated by Simon de Montfort; p. 10,972.

Lewes, George Henry (1817-78), English man of letters, born in London. His early writings were chiefly for periodicals. The most important were those on the drama, republished as *Actors and the Art of Acting* (1875). Lewes was editor of the *Leader* (1849-54), founded the *Fortnightly Review* (1865), and was for a time its editor. His association with George Eliot, which began in 1854 only ended with his death. The most important of his later works are *Problems of Life and Mind* (1874-9); *The Study of Psychology* (1879).

Lewis, James (1840-96), American actor, was born at Troy, N. Y., and made his first appearance at the Troy Museum (1858) in the part of Farmer Gammon, in *The Writing on the Wall*. His first appearance in New York City was made (1866) at the Olympic theatre in Mrs. John Wood's company as low

comedian. Three years later he was engaged by Augustin Daly as leading comedian for the latter's stock company, a position he filled with continual success until his death.

Lewis, John L. (1880-), American labor leader, president of the United Mine Workers of America since 1919, and member of the Coal Production Committee of the Council of National Defence (1917). Son of Welsh miners, Lewis began his own career in the coal pits of the Middle U. S. He led the great bituminous strike of 1919, which won a 27 percent wage increase. In 1937 after a disagreement with the administration of the A. F. of L., he was a leader of the big C. I. O. sit-down strikes in the automobile industry and of the great steel strikes. In 1943, after drawing the U. M. W. from the C. I. O., he came to grips with Roosevelt in the coal crisis of that year.

Lewis, Meriwether (1774-1809), American explorer, born near Charlottesville, Va. Pres. Jefferson caused his selection as one of the leaders, with Lieut. William Clark to lead what has become known as the 'Lewis and Clark Expedition' across the continent (1804-6) to explore the region acquired in the Louisiana Purchase. The exploring party, consisting at the outset of about 45 men, 14 of whom subsequently returned with reports and various collections, left St. Louis, in May, 1804, and, proceeding by way of the Missouri, Jefferson, and Columbia rivers, reached the Pacific at the mouth of the Columbia in Nov., 1805. Here they spent the winter, and in Nov., 1806, were again at St. Louis. The story of the expedition is one of the most interesting in the history of American exploration. A vast amount of valuable data, physiographic, climatic, and biological, was gathered concerning the country traversed.

In 1905, at Portland, Oregon, the centennial of the expedition was celebrated by the holding of the Lewis and Clark exposition.

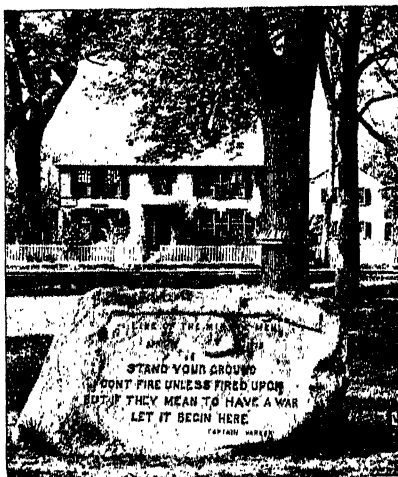
Lewis, Sinclair (1885-). American author and first American Nobel Prize winner for literature. In 1920 he became universally known through his novel *Main Street*. Other novels are *Babbitt* (1922); *Arrowsmith* (1924); *Elmer Gantry* (1927); *Dodsworth* (1929); *Ann Vickers* (1933); *Work of Art* (1934); *It Can't Happen Here* (1936); *Gideon Planish* (1943).

Lewis and Clark Centennial, American Pacific Exposition, and Oriental Fair.—An exposition held in Portland, Oregon, from June to October, 1905, in commemoration of the centennial anniversary of the exploration of the Oregon country by the expedition

commanded by Captains Meriwether Lewis and William Clark, and planned by President Jefferson. There were eight principal structures as follows: Agriculture, European Exhibits, Oriental Exhibits, Forestry and Mines and Metallurgy, Fine Arts, Varied Industries and Machinery, Electricity, and Transportation. Under the auspices of the Government, exhibits were made from the various Departments and the Smithsonian Institution. These were of special interest and included exhibits of fisheries, and life-saving appliances, and a comprehensive Philippine exhibit. The grand total attendance was 2,545,509, of which number 70,000 were visitors from the Mississippi Valley and Eastern States. The Exposition was a financial success.

Lewisburg, tn., Pa. It is the seat of Bucknell University (Bapt.); p. 3,571.

Lewisia, a genus of dwarf N. American herbaceous plants, order Portulacaceæ, with only one species, *L. rediviva*, the bitter root. The plant has large handsome pink and white flowers.



Lexington, Mass.: Monument in the Common, showing the Line of the Minute Men.

Lewiston, city, Maine, Androscoggin co., on the Androscoggin River at the falls. It is the seat of Bates College and the Bates Theological School. The falls supply water power for the manufacture of woolen and cotton goods; p. 38,598.

Lewis-with-Harris, the northernmost of the Outer Hebrides. See **HEBRIDES**.

Lexicon. See **Dictionary**.



Dalai Lama seated on his Throne.

Lexington, city, Kentucky. It is the seat of the University of Kentucky, Transylvania College. Features of interest are Ashland, the home of Clay, General John Morgan's home, and the Clay and Breckinridge monuments. Flour, foundry products, building supplies, carriages and wagons, harness, and canned goods are manufactured. The chief industries, however, spring from agriculture and the breeding of blooded live-stock. The city is the centre of the 'blue-grass country,' famous for its horses and cattle. Racing horses are bred here, and tobacco and hemp are cultivated. The site was named in 1775 to commemorate the battle of Lexington, and a permanent settlement was made in 1779; p. 49-304.

Lexington, tn., Massachusetts. Among the features of historic interest are the Common, or Battlegreen, the Revolutionary monument, the Monroe Tavern, the Buckman Tavern, the Hancock House, a memorial hall containing statues of Samuel Adams and John Hancock, and the old Belfry. Lexington is notable as the scene of the first bloodshed of the Revolution, which occurred about daybreak on April 19, 1775. It was in connection with this conflict that Paul Revere made his famous ride from Charlestown to Lexington, warning the inhabitants on his way. Lexington was settled in 1642 and first incorporated in 1713. Theodore Parker was born here; p. 13,187.

Lexington, city, Missouri, co. seat of Lafayette co. The Central Female College (M. E.), Baptist Female College, and Wentworth Military Academy are situated here. The town was taken by the Confederates, in September 1861, but was regained by the Federals a few days later; p. 5341.

Lexington, tn., Virginia. Washington and Lee Univ. and Virginia Military Inst. are situated here. The burial place of Robert E. Lee and 'Stonewall' Jackson; p. 3,914.

Lexington, 33,000-ton U. S. aircraft carrier, destroyed in Battle of Coral Sea, 1942.

Lex Loci. (Lat. the law of the place). Many transactions are governed by the law of the place, and not by the law of the domicile of the parties.

Leyden, or **Leiden** (anc. *Lugdunum Batavorum*), city, Netherlands. It is one of the oldest cities in the Netherlands and is the seat of a famous university founded in 1575. Other noteworthy features are the Museum of Antiquities; the Church of St. Pancras, a handsome 15th century edifice; the Castle, dating from the 10th century; the Ethno-

graphical Museum; the Stadhuis, and the Gothic church of St. Peter. In the 14th century the town was famous for its cloth and baize. The painters, Rembrandt, Lucas van Leyden, Jan Steen, Gerard Douw, and Van Mieris were natives of Leyden, as were the Anabaptist leader Jan Bockold, or John of Leyden, and some of the Elzevirs. In 1573-4 the town heroically withstood a terrible siege by the Spaniards. A body of English Puritans, some of whom became the founders of the Plymouth Colony in America, took refuge in Leyden from 1609 to 1620; p. 65,694.

Leyden, **John** (1775-1811), Scottish poet and Orientalist was born in Denholm, Roxburghshire. He was on terms of closest intimacy with Scott, in whose *Minstrelsy* appear several of his ballads. His chief poem, *Scenes of Infancy* (1803), is a universal favorite in Teviotdale. His best piece is probably the *Address to an Indian Gold Coin*.

Leyden Jar, a particular form of electrical condenser, named from the place where the principle of its construction was discovered.

Leyds, **Willem Johannes** (1859-1940), Dutch diplomat, was born in Magelang, Java. He was appointed attorney-general of South African Republic in 1884 and held that post until he was elected state secretary in 1888. He resigned the office in 1898 and became minister plenipotentiary in Europe. His publications include: *The First Annexation of the Transvaal* (1906); *Derde Verzameling* (Correspondentie, 1900) (1931).

Leyts, **Hendrik**, **Baron** (1815-69), Belgian historical and genre painter, was born in Antwerp. He made the 'resuscitation of a national art' his aim, and painted the illustration of Flemish history in the Hotel de Ville, Antwerp. His works gave him a European reputation.

Leyte, one of the largest islands in the Philippines; it produces corn, rice, sugar, and coffee; the capital, Tacloban. Island; p. 600,000. In October 1944 the Americans invaded the Japanese-held island and drove out the enemy after a bitter series of battles.

Leze-majesty (cf. mod. Fr. *léser*, 'to injure'), an insult to, or an offence committed against, the person of a sovereign, punishable by death in Great Britain. It comes under the law of treason, of which the essential features are traceable to an act of Edward III. Abroad leze-majesty includes many less serious offences than those dealt with by this act.

Lhasa, **Lassa**, **Hlassa**, or **Losa**, 'Abode of the Divinity,' 'of the Divine Intelligence,'

'of the Venerable One', cap. of Tibet, metropolis of Lamaite Buddhism, seat of the 'Dalai Lama' ('Sea of Wisdom'), chief tn. of Uí prov.; over 11,800 ft. above sea level. The chief edifices of Lhasa are sacred. Among the leading monasteries are those of Miru or Muru; Daibun or Daibung, the largest monastery of the sacred town; Sera, renowned for its ascetic hermits, as Daibun is for its seers, or the more distant Galdan for its relics. Daibun, Sera, and Galdan were all founded by the Buddhist reformer Tsonhava, or during his lifetime, at the beginning of the 16th century. They are now not so much refuges of eremites as schools for teaching philosophical theology. The cathedral, Jowo-khang, or Jo-K'ang, the true Lhasa, or 'place of the gods,' and the Potala, the palace of the Dalai Lama, w. of the city proper, are the chief sites of Lhasa. The Jo-K'ang contains the famous golden image of the Buddha, said to represent him in his youth. The present residence of the Buddhist pope, a towering building of four stories, on the summit of the 'Haven hill' which rises abruptly out of the plain in which Lhasa stands, and terminating in five gilded domes, was an offering from Kanghi, first Manchu emperor of China, replacing a building destroyed by the Dungans at the beginning of the 18th century; but from the 7th century A.D. the Potala mount has been one of the holiest places of the Buddhist world. Its treasury contains a famous collection of sacred objects both old and new.

The principal industry of Lhasa is woollen manufacture, but silk stuffs, tea, and other Chinese products are here exchanged for Indian, European, Russian, and other wares. Lhasa was perhaps visited by the Franciscan traveler Odoric of Pordenome in about 1328, on his way home from China to Europe; if so, he was the first European to see it. In the 17th and 18th centuries several Jesuit and Capuchin missionaries (Andrada, 1624; Grueber and Dorville, 1661; Desideri, 1716-29; Della Penna, 1719-41) penetrated here, as well as the Dutch layman Van de Putte (1724). After 1760 access was forbidden to Europeans; but a few have eluded the restriction since, such as Manning in 1811 and Huc and Gabet in 1844. On Aug. 3, 1904, a military expedition from British India arrived at Lhasa, and on Sept. 7 a treaty was signed, by which trade facilities with British India were increased, and the exclusive attitude of

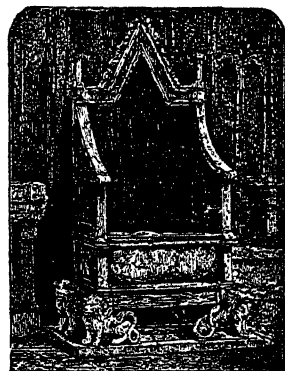
the Tibetan government was somewhat modified; p. 26,000.

Lherzolite, a dark green or black crystalline rock which consists of olivine enstatite, and augite (chrome diopside). It is a member of the peridotite group, and has long been known to occur at Lherz in the Pyrenees.

L'Hôpital, Michel de (1507-73), chancellor of France (1560-8), who tried to carry out a liberal-minded policy during the regency of Catherine de' Medici for her son Charles ix. He staved off the Inquisition, opposed persecution, and held the balance between Roman Catholics and Huguenots in the civil wars.

Li, a Chinese measure of distance, equal to rather over one-third of an English mile.

Lia Fail, the *Fatale Marmor*, or 'Stone of Destiny,' on which the ancient Irish kings sat at their coronation, and which was said traditionally to utter a groan if the person who occupied the seat was a pretender. It now forms a part of the coronation chair in Westminster Abbey.



The Coronation Chair, with the 'Stone of Destiny.'

Liana, a name given to the woody, climbing, and creeping plants of tropical forests.

Libanius (c. 314 to after 391 A.D.), Greek rhetorician. Several of his works survive, the most important of them being sixty-seven speeches and more than a thousand letters, which are elegant in style and historically important.

Libanus. See **Lebanon**.

Libation, an offering of wine or other liquor made to the gods of Greece and Rome. A libation in ancient Greece was the chief ceremony in concluding a peace—

the literal translation of the Greek word for a treaty of peace being 'libations.'

Libau, Libava, or Liepaja, tn., port, and important Baltic naval station in Latvia, formerly northwestern Russia. The industries have greatly increased, the principal manufactured products being farm machinery, flour, timber, explosives, furniture, etc. Libau is connected directly by rail with the wheat regions of the Empire. The commercial or winter harbor is ice-free throughout the year. Libau was captured by the Germans in 1915, and used by them as a naval base; p. 65,000.

Libby Prison, a Confederate prison in Richmond, Va., which was used as a tobacco warehouse by its owner, a Mr. Libby, before the Civil War and in which during the war Federal prisoners, chiefly officers, were confined. Conditions were extremely unsanitary, the building was at times overcrowded, and the prisoners suffered terribly in consequence.

Libel. A libel is written defamation made public, the effect of which is to impair the reputation of a person for honesty, decency, or virtue, or to injure him in his business, occupation, or public office, or to bring upon him public contempt, ridicule, or hatred, or cause him to be shunned or avoided. This may be done by handwriting, printed matter, pictures, or signs, which may reasonably be understood to refer to the person intended by the author, by those who know him. The fact that the matter is false is sufficient. In general, a person may sustain an action against the author or instigator of any matter published about him, falling within the above definition, without proof of special damage as a result thereof, and this is an arbitrary distinction between libel and slander.

Liber, a name frequently given by Latin poets to the Greek god Dionysus; but the god Liber and the goddess Libera were ancient Italian deities, who protected the vine and gave fertility to the fields—hence they were worshipped along with Ceres.

Liberalism, a term used in politics and in ecclesiastical controversy, and subject, therefore, to some ambiguity when it is used in both ways. The term seems to have been first used in Spain, to indicate the advocates of freedom in church and state along what may be called constitutional lines. Liberalism was anti-clericalism, as the corresponding movement in France and Italy, however named, has generally been. But

liberalism has always claimed the merit of working on constitutional lines, or of working to secure a constitution as a guarantee of freedom. Under one name or another, liberalism appears in the politics of every modern state.

Liberalism in England dates from the period of the Reform Act, when, owing to the extension of the suffrage, the power of the Whig houses began to decline.

In America, the term Liberalism came into prominent use during Theodore Roosevelt's Progressive Party movement of 1912, the counter-term conservative being applied to the two old major parties and Roosevelt's doctrines being characterized as Liberal. But the Democrats under Woodrow Wilson insisted they were the true Liberals. Once again, in 1933-35, those partisans of President Franklin D. Roosevelt who were most enthusiastic for the New Deal and who felt that reactionary influences within the party were whittling away his idealism, revived the word and applied it to themselves. Every New Dealer who believed in advancing the cause of labor, in extending the authority of the government over big business, in expending larger sums of public money to combat the depression, was called a Liberal; those who thought the brake ought to be applied after the first sweeping movement of the New Deal were regarded as Conservatives.

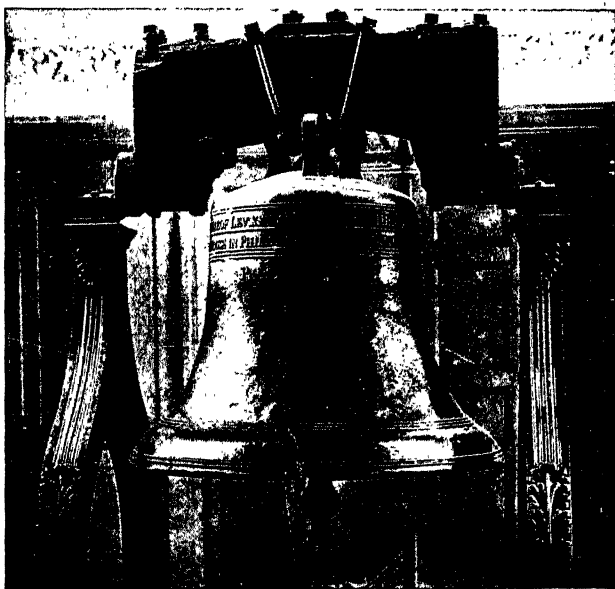
Liberal Party, a political party in the United States which nominated candidates in the Presidential campaigns of 1840 and 1844, and which was organized by that group of Abolitionists who believed that the fight against slavery should be carried into politics. On Nov. 13, 1839, the 'Constitutional Abolitionists,' as they were called, assembled at Warsaw, N. Y., and nominated James G. Birney for President. This nomination was later confirmed by a convention held at Albany, N. Y., and the name of Liberty Party was adopted. In August, 1844, a National Liberty Party Convention, in which twelve States were represented, met at Buffalo, N. Y. James Birney was again nominated for the Presidency, Thomas Morris of Ohio was named for the Vice-Presidency, and a platform was adopted demanding 'the absolute and unqualified divorce of the general government from slavery, and the restoration of equality of rights among men.' The contest of that year between the successful Democratic candidate, James K. Polk, and the Whig candidate, Henry Clay, was exceedingly

close; and if the Liberty Party had not nominated candidates, a large proportion of the political Abolitionists would have voted for Clay, who would thus have probably carried the State of New York, and the election to the Presidency. The Party's action was thus indirectly responsible for the annexation of Texas, the war with Mexico, and the consequent question of slavery in the Territories formed from the country acquired from Mexico.

Liberal Republican Party, in American history, a political organization which had its origin in Missouri in 1870, where a fusion of Republicans and Democrats elected

thereby alienated. Greeley died before the meeting of the Electoral College, when Grant was given 286 of the 349 electoral votes. With this campaign the Liberal Republican Party passed out of existence. While the movement seemed a failure, yet it hastened the General Amnesty Act; induced the Democratic Party to acquiesce in the outcome of the Civil War, to work for public credit and against repudiation; and began the work of tariff and civil reform.

Liberia, independent negro republic, situated on the Grain Coast of West Africa, between Sierra Leone on the w. and the French Ivory Coast Colony on the e. It



Liberty Bell, Independence Hall, Philadelphia.

B. Gratz Brown governor of that State on a platform calling for amnesty, universal suffrage, of negroes and rebels, and the reform of the tariff and the civil service. In 1872 a National Liberal Republican Convention was held in Cincinnati, and Horace Greeley was nominated for President and Governor Brown for Vice-President. The platform as adopted vigorously arraigned the administration of President Grant. Both the platform and the nominations of the Liberal Republicans were adopted by the Democratic Party in their National Convention, but their adhesion was not enthusiastic, while many Republicans were

extends for about 350 m. and reaches inland for about 200 m., its present boundaries having been determined by the Anglo-Liberian and Franco-Liberian agreements of 1885, 1892, and 1907-10. Area, about 40,000 sq.m. Except for the low, narrow, coastal plain, the surface is everywhere hilly. The temperature is high and fairly uniform, generally ranging between 100° F. at noon and 75° F. at night. The rainfall is heavy. The vegetation is tropical and luxuriant. Mahogany, ebony, and other valuable timber trees, camwood, gum trees, rubber-producing trees and plants, oil and bamboo palms, and the great cotton tree are among

the products of Liberia's many available forest resources.

The chief economic dependence of the republic is trade in raw products. Exports include rubber, piassava fibre derived from the raphia palm, palm oil, palm kernels, camwood, cocoa, coffee, ivory, ginger, and annatto. In 1926, Harvey S. Firestone, the American tire manufacturer, obtained a million-acre rubber concession from the Liberian government and planted 30,000 acres of rubber trees. The government of Liberia is modelled on that of the United States. The American Colonization Society, to which Liberia owes its origin, was organized in 1816 for the purpose of promoting and putting in execution a plan of colonizing the free negroes of America in Africa. In 1910-11 negotiations were completed whereby the United States assumed supervision of the finances, military organization, agriculture, and boundary questions of the republic. In 1931, the United States Government accepted the invitation of the League of Nations to be represented on an international committee to aid Liberia to establish reforms for abolishing slavery and eliminating unsanitary conditions.

Liberty, city, Missouri. It is the seat of Liberty Ladies' College and the William Jewell College (Baptist); P. 3,598.

Liberty, village, Sullivan co., New York. Situated at an elevation of nearly 2,000 ft. in the Shawangunk Mountains, in the midst of fine scenery, it is a well-known health and summer resort; p. 3,788.

Liberty Bell, a bell cast in London in 1752, brought to Philadelphia, and recast in that city in 1753, when the inscription, 'Proclaim liberty throughout the world, unto all the inhabitants thereof,' was placed upon it. According to the legend, now discredited by some writers, it rang on July 4, 1776, after the debates over the Declaration of Independence had ended, in order to 'proclaim liberty throughout all the land,' and was rung on each succeeding anniversary of this famous Declaration until July 8, 1835, when it cracked while being tolled for the death of John Marshall. The Liberty Bell is now kept on public exhibition in the hall-way of Independence Hall in Philadelphia.

Liberty, Equality, Fraternity (*Liberté, Égalité, Fraternité*), the motto of the French Republic, dates from the time of the first Revolution.

Liberty Loans, a series of popular loans to the U. S. Government for the conduct of

the war with the Central Powers (1917-18). The First Liberty Loan was offered to the public in May, 1917. The bonds bore interest at the rate of $3\frac{1}{2}$ per cent., the total subscriptions amounted to \$3,035,226,850. A feature was the number of small investors who took part, the total individual subscribers numbering more than 4,000,000. The Second Liberty Loan was opened on Oct. 1, 1917, and closed on Nov. 1. The rate of interest was increased to 4 per cent. The total subscription was \$4,617,532,300. The Third Liberty Loan was offered to the public on April 6, 1918, the first anniversary of the declaration of war on Germany by the United States. On May 4, 1918, the Third Liberty Loan was closed with a total subscription of \$4,176,516,850. The Fourth Liberty Loan was opened to subscription on Sept. 28, 1918, and was closed on Oct. 19. The total subscriptions to the fourth loan amounted to \$6,989,047,000; the total number of subscribers was more than 21,000,000, or one in every five in the United States. A Fifth Liberty Loan, known as the *Victory Liberty Loan*, was offered to the public in April, 1919. This loan, at $4\frac{3}{4}$ per cent. was subscribed for \$5,250,000,000.

Liberty Motor, a standardized 12-cylinder gasoline engine designed in 1917, under direction of the U. S. Aircraft Production Board, for airplanes requiring 400 horsepower; for use in two-seated fighters, army and corps observation planes, day and night bombers, photographic machines, and seaplanes. The motor is the work of Majors Vincent and Hall, assisted by consulting engineers and motor manufactures throughout the United States.

Liberty of the Individual implies man's right of free development in all his faculties, subject only to restraints necessary for the common good, or those imposed by law. Among the great historical documents which have set forth the rights of the individual are the British Magna Charter and Bill of Rights; the French Declaration of the Rights of Man, and the Constitution of the United States.

Liberty, Statue of, a colossal bronze figure, the tallest in the world, that stands on Bedloe's or Liberty Island in New York Harbor. It was designed and executed by the French sculptor M. Bartholdi for presentation by the citizens of France to the people of the United States on the occasion of the rooth anniversary of American in-

dependence (1876). The statue represents a female figure holding aloft a torch, 'The Goddess of Liberty enlightening the world.' Access to the head and torch is gained by an inside circular staircase. The cost of the statue is estimated at \$250,000; the cost of the pedestal and erection, \$350,000.

Liberty Tree, one of the finest of a number of elms which formerly stood in Boston on what was known in the 18th century as Hanover Square. At daybreak of Aug. 14, 1765, when the citizens of that city were fuming with wrath against the first Stamp Act, this particular tree was found decorated with an effigy of Mr. Oliver, the stamp officer, and a boot, out of which peeped the devil, the boot being a punning reference to King George's minister, Lord Bute.

Libin, Z. (1872), pseudonym of Israel Hurewitz, American Yiddish dramatist and journalist, born in Gorki, Russia. His first play appeared in 1898 and was followed by other plays and short stories. Among the former are *The Jewish Medea* (1901), and *Broken Hearts* (1905). *Yiddish Sketches* (1901), a volume of about fifty stories portraying the life of the Jews of the lower East Side in New York City, is considered by some the author's masterpiece.

Libitina, a Roman deity presiding over funerals. Funeral requisites were performed by undertakers called *libitinarii*, and the name of the deceased was inscribed in a book for this purpose (*Libitinae*).

Libocedrus, a genus of evergreen coniferous trees, bearing oval, obtuse, woody cones. *L. decurrens*, growing on the Pacific Coast of the United States, is an ornamental evergreen, with glossy scale-like leaves. It is sometimes called the White Cedar, and its yellowish wood is very durable. It grows to a height of about 140 ft., the lower half devoid of branches.

Libourne, town and river port, capital of Gironde department, France. It was one of the ancient free towns, founded by the English in 1269. It contains the Church of St. Jean Baptiste (15th century), a clock tower dating from the 14th century, and a 16th-century Tower Hall; p. 20,085.

Libra, an ancient constellation, and the seventh sign of the zodiac, characterized by a symbol. The Greeks called it Chelæ, the 'Claws' (of the Scorpion); the Romans, Jugum, the 'Yoke,' or Libra, the latter title finally prevailing through its adoption in the Julian calendar. The sign

is entered by the sun about Sept. 23; the constellation not until Oct. 29.

Libraries. Public libraries in the modern sense of the term—instituted for the purposes of research in all branches of knowledge—have existed from the most remote antiquity. The earliest known library is that of the school for Babylonian savants at Sippara of the Sun, on the banks of the Euphrates, founded 41 centuries ago by the companions of Xisuthros when they returned and unearthed the tablets of baked clay, buried by his orders, on which were recorded in cuneiform letters all antediluvian knowledge and the account of the deluge. Similar chambers of records were found at Nineveh, in the palace of Assurbanipal, king of Assyria, where on shelves of slate, classified and catalogued, were kept tablets recording the archives and literature of the empire. To Greece belongs the credit of having the first library open to the public, founded at Athens by Pisistratus in the 6th century B.C., and largely increased by the Athenians themselves. Euripides, Plato, and Aristotle were book collectors: the latter, Strabo says, 'being the first who made a collection of books and taught the kings of Egypt how to arrange a library.' The famous library at Alexandria, for centuries the literary center of the world, was founded by Ptolemy Soter, with the assistance of Demetrius of Phaleros, the rhetorician.

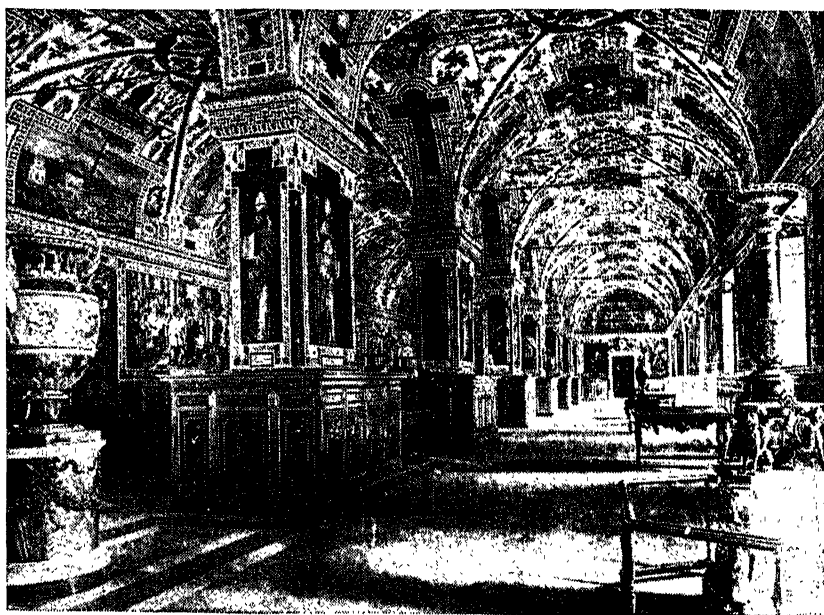
There is abundant information regarding libraries in ancient Rome, made up at first exclusively—and for centuries largely—of works written in Greek. Cicero was a great collector of books and he declared that a country house could not be complete without a library. C. Asinius Pollio had the honor of establishing the first public library, which he placed on the Aventine Hill. Augustus erected the Palatine Library and placed another in the Portico of Octavia, and libraries were also formed by Tiberius, Vespasian, and Domitian. The finest of Roman libraries was the Ulpian Library, founded by Trajan. In the meantime, as Christianity became more widespread in its influence and a distinctively Christian literature was developed, libraries were established in connection with many of the larger churches. During the centuries of the Dark Ages books found almost their only homes within the walls of monasteries. To the monks of the Order of St. Benedict in particular are we indebted for their devotion to ancient

literature and the preservation of its monuments in such form as a thousand years later furnished 'copy' for the presses of Gutenberg, Aldus, Froben, and Stephens. The Abbey of Monte Cassino, which was founded by St. Benedict in 529, and which served as a model for the later monasteries of the order, had a splendid collection.

In Great Britain the earliest library was that of the monastery of Christ Church, Canterbury, originally founded about the year 600. The Benedictines had important

stitution. As this development is most striking in the United States, it will be considered under that heading.

The library of the Vatican at Rome is the oldest and richest of modern libraries, though its present collections date back only to the late 15th century. It has enjoyed the special favor of a long line of book-loving Popes, and includes in its collections Greek, Latin, and Oriental manuscripts of priceless value and more than 400,000 printed books, some of them of great rarity. It was de-



The Library of the Vatican.

libraries also at York, where Alcuin was trained for his later work on the Continent, and at Durham, Wearmouth, Jarrow, Bury St. Edmunds, Reading, and St. Albans. The Franciscans and Dominicans maintained libraries in London and at Oxford. Modern library history may be divided into two periods. The first, lasting from the 16th to well into the 19th century, has been described as the age of great libraries, and is characterized by the accumulation of rare and beautiful books and the amassing of collections rich in material for the research of the scholar. The second, beginning with the middle of the 19th century, is the era of the public library as it is known today, and its growth as a popular educational in-

prived of many of its treasures by the French in 1798, but the greater part of these were returned at the peace of 1815. The Laurentian Library at Florence, founded at about the same time as that of the Vatican, is not large in points of numbers, but in the interest and rarity of its collections is one of the richest libraries in the world. The Bibliothèque Nationale of France was established toward the end of the 14th century by Charles v., on the foundation of the books and manuscripts collected and bequeathed to him by his predecessor, Jean le Bon, and from this foundation has sprung the world's greatest collection of books. See BIBLIOTHÈQUE NATIONALE. The National Library of Great Britain, commonly known

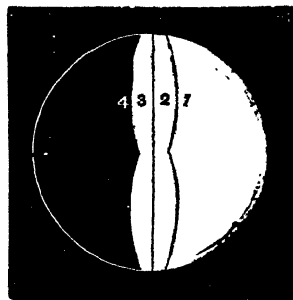
as the British Museum Library, was founded in 1753, and ranks next in size to the Bibliothèque Nationale. See **BRITISH MUSEUM**. The Bodleian Library at Oxford, founded by Sir Thomas Bodley, contains large collections of rare value, while the University Library at Cambridge is also of the first rank.

Germany has many large libraries offering unexcelled facilities for scientific research. The most notable are the Royal Library, at Munich, established by Albert v., Duke of Bavaria, about the middle of the 16th century, the Royal Library of Dresden, and the Royal Library of Berlin. Most of the first libraries in America were founded in connection with educational institutions, the earliest being that established in 1621 by the gift of an unnamed person in London to the college for the education of the natives at Henrico, Va. In 1638 John Harvard bequeathed one-half of his property and his library of 300 volumes to Harvard University, founded two years earlier. Yale began in 1700 with a donation of books from each of its ten trustees, with the words, 'I give these books for the founding of a college in Connecticut.' Kings College, now Columbia University, chartered in 1754, received in 1756, by request of Dr. Bristow of London, his library of about 1,500 volumes, which was supplemented by the library of Joseph Murray and other gifts of books.

Boston took the lead in the foundation of public libraries in the United States. A library was established in the Town House through the will of Captain Keayne, dated 1653. In 1700 New York City received a donation of books from Rev. John Sharp. In 1731 Benjamin Franklin organized the first American subscription library, known as the Library Company of Philadelphia. In 1800 the Library of Congress at Washington was founded. Mention should be made of the large benefactions which have stimulated the growth of public libraries during the past 20 years. The most noteworthy are the benefactions of Andrew Carnegie. These gifts have almost invariably taken the form of buildings erected on condition that the municipality contract to maintain the library by an annual grant of at least one-tenth the value of the gift. Features of modern library work are cooperation with the schools; the provision of traveling libraries or collections of books to be sent to rural communities, schools, factories, hospitals, settlements, etc.; the circulation of books

for the blind; and library advertising. The largest public library in the U. S. is the New York Library with 3,817,000 volumes. See **LIBRARY OF CONGRESS**; **NEW YORK PUBLIC LIBRARY**.

Library Association, American, the general and national library organization of the United States, having as its object the promotion of the welfare of libraries in America, was founded in 1876, following a national conference of librarians held in connection with the Centennial Exposition at Philadelphia. Membership is institutional and personal, and includes libraries, library associations, librarians, and others interested in library work. Meetings are held annually, with general sessions, and sections on cataloguing, problems of interest to trustees, professional training, children's work, school libraries, public documents, college and reference work, agricultural and theological libraries, and other matters of special interest. An important feature of the Association is the Publishing Board, which prepares and issues bibliographies, book lists, and other special aids to library workers.



The Moon's Librations.

- 1, Part always seen; 2, part carried out of view by libration;
- 3, part brought into view by libration; 4, part never seen.

Library of Congress, Washington, D. C., was established in 1800 by an Act of Congress. It was destroyed by fire in 1814; was rehabilitated by the purchase of ex-President Jefferson's library in 1815; and was partially destroyed by a second fire in 1851. Seventy-five thousand dollars was appropriated by Congress for its replenishment at that time, and its subsequent growth has been continuous. In 1866 an agreement was reached whereby the library of the Smithsonian Institutions was deposited in

the Library of Congress with the stipulation that future accessions should follow. The collection is now among the largest in the world, comprising upward of 9,000,000 items, including 6,125,000 printed books and pamphlets.

Among the notable collections of the Library are the most important extant manuscripts for the sources of American history; official documents of all countries; serials; American imprints; maps, charts, and atlases; Oriental literature; bibliographic material; genealogy; and works on political science, public law, and legislation. Books are available for reference use to the general public, but may be drawn for home use only by Senators and Representatives, certain government officials, and others designated by statute. In 1897 the Library was moved to its present edifice, the largest library building in the world, erected at a cost, including land, of \$7,000,000. The Library is under the administration of the Librarian of Congress and the Superintendent of the Library Building and Grounds, who are named by the President, subject to confirmation by the Senate. The Copyright Office forms a distinct division of the Library under the Librarian, but in direct charge of the Register of Copyrights. In 1933 work was completed on an addition to the present building.

Libration, an apparent oscillation to the lunar globe, by which otherwise invisible sections of it are brought into view.

Libretto, a name generally applied to the words or story of a musical drama or opera.

Libreville, tn., French Equatorial Africa, is an important seaport and coaling station; p. 4,000.

Libris, Ex. See **Bookplates**.

Libya, ancient name for Africa. Also an Italian colony in North Africa, the scene of battle between the Allied and Axis forces during World War II. It was taken by the Allies in 1943; p. (1939) 888,401.

Libyan Desert, a region in N. Africa, including parts of Egypt, Tripoli, and Barca, and lying to the w. of the Nile. A series of deep depressions contains the famous oases Khargeh, Dakhel, Farafrah, Baharieh, and Siwah. Westward the desert merges into the unexplored wastes of the Sahara.

Lice, a group of minute parasitic insects belonging to the family Pediculidae of the order Hemiptera. The body is flat with a thin integument, and entirely wingless, the thoracic segments are indistinctly separated,

and the feet end in a single long claw. The mouth parts, which are retracted within the head when not in use, include a suctorial tube by means of which the parasite sucks the blood of its host.

License, in law, an authorization to do some act or carry on some occupation which, without such authorization, would be illegal. In real property law the term license indicates permission granted by a land owner, either with or without consideration, to perform some act or series of acts upon his land, as to hunt or fish, or to convey water or oil through pipe lines. In governmental regulation licenses are granted for the performance of a large number of acts, and for the carrying on of numerous occupations. The liquor license is a familiar type of governmental regulation. See **PROHIBITION**. Other purposes for which licenses are granted by the civil authorities are the practice of medicine or law; the privilege of conducting places of public amusement, as theatres; marriage; the keeping of dogs, and automobiles; the sale of tobacco; the manufacture and sale of playing cards and patent medicines; and the callings of peddler, pawnbroker, auctioneer, and appraiser.

Lichen (Gr. *leichen*, 'canker'), an eruption of the skin. It is characterized by the presence of numerous small red spots which are slightly elevated above the skin.

Lichenin, or **Moss Starch**, occurs in many lichens, notably Iceland moss, from which it may be extracted by boiling water as a gelatinous solution.

Lichens are the familiar vegetable growths clothing the stems and branches of trees, rocks and stones, with their shaggy fronds, or forming brilliantly colored patches on roofs, walls, and on the earth itself. They are common in every zone, and at all levels from the seashore to the mountain summit. Some lichens are of commercial value: litmus and orseille are obtained from species of the genus *Rocella*; Iceland moss is used as a demulcent; the Laplanders feed their reindeer in the winter on *Cladonia rangiferina*; the Tartars make 'earth bread' from an encrusting form which grows on rocks in the steppes; and the 'tripe de roche' afforded a valuable food to explorers and voyageurs in Northern America.

Lichfield, munic. bor., co. in itself, and city, in Staffordshire, England. The cathedral, commenced in the 12th century and completed in the 15th, is one of the most beautiful in England, its most striking feature being the three

graceful spires. The church of St. Chad, of the time of Henry VII., is near the site of the hermit's cell (7th century). Dr. Samuel Johnson was a native; p. 8,617.

Lick, James (1796-1876). See **Lick Observatory**.

Lick Observatory, an astronomical establishment founded by James Lick of San Francisco (1796-1876), at a cost of \$700,000. He chose a site on the summit of Mt. Hamilton, California, at an altitude of 4,280 ft., and provided in his will for the erection there of the most powerful telescope in the world. The instrument is a 36-inch refractor by Alvan Clark and had no rival for a number of years until surpassed by that of the Yerkes observatory of the University of Chicago.

Licorice, the root or underground stem of the plant *Glycyrrhiza glabra*. As it occurs in commerce the root is usually in cylindrical-branched pieces—tough and brown in color. It is sweet and mucilaginous to the taste.

Lictors, the name of the attendants of the magistrates in Ancient Rome.

Liddell Hart, (Capt.) Basil Henry (1895-), military critic and historian, was born in Stroud, England. He is Military Editor of the *Encyclopedia Britannica*; invented the Battle Drill system in 1917 and the Expanding Torrent method of attack, which has been officially adopted since the war. He wrote *The Remaking of Modern Armies* (1927); *Reputations—Ten Years After* (1928); *The Real War 1914-1918* (1930); *The Ghost of Napoleon* (1933).

Liddell, Henry George (1811-98), English classical scholar, best known as author, with Dean Scott, of the standard *Greek Lexicon*.

Lidici, village (p. 1,200) in Czechoslovakia, burned by the Nazis June, 1942. Its men were killed, its women and children removed to Germany, in reprisal for being near the scene of the killing of Reinhard Heydrich of the Nazi Gestapo.

Lie, Jonas (1880-1940), American landscape and figure painter, born in Norway. He is represented in the Metropolitan Museum, New York City; Luxembourg Museum, Paris; Art Institute, Chicago; Boston Museum.

Lie, Jonas Laurits Idemil (1833-1908), Norwegian novelist, was born in Ecker. He wrote a series of excellent romances.

Lieb, John William (1860-1929), American mechanical engineer, was born in Newark, N. J. He was in charge of the installation of electrical equipment in the old Pearl Street Edison Station, New York, the first

electrical station in the United States. He was subsequently vice-president and general manager of the New York Edison Company, and president of the Electrical Testing Laboratories.

Lieber, Francis (1800-72), American educator and author, was born in Berlin. In 1932-4 he helped formulate the educational system for Girard College, Philadelphia. Lieber was a voluminous writer, his works including poems, travels, political and economic treatises.

Liebermann, Max (1849-1935), German painter, was born in Berlin. In 1884 he settled in Berlin, where he became professor at the Academy, and one of the leaders of the Secessionist art movement. Among his works are: *The Cobbler's Shop* (1881); *Polo Players* (1902); *Dutch Landscape* (1912).

Liebig, Justus, Freiherr von (1803-73), German chemist, was born in Darmstadt. He discovered chloral (1831) and chloroform (1832). He also worked out much of the chemistry of the life processes of animals and plants, and in this connection discovered the necessity of returning saline ingredients to the soil, this discovery alone entitling him to rank as one of the founders of agricultural chemistry. He also did important service in elucidating the chemical actions occurring in cooking, and in inventing the extract of meat with which his name has been connected. Among his other practical discoveries may be mentioned the invention of silver-coated mirrors, an easy method for the preparation of potassic cyanide, his plan for making unfermented bread, and his methods for analyzing mineral waters.

It is as a teacher, however, that Liebig is perhaps most famous, having founded the first laboratory in which students might supplement class-room instruction with practical and experimental work. He founded the *Annalen der Chemie und Pharmazie* (1832); and edited the *Jahresbericht der Chemie*.

Liebknecht, Karl (Paul August Ferdinand) (1871-1919), German Socialist leader. He was a vigorous and fearless opponent of militarism in Germany, and in 1907 was sentenced to eighteen months in a military prison for publishing an anti-militaristic pamphlet; in 1912 he assailed the authorities for permitting the Czar of Russia to visit Germany, and brought about the investigation of the Krupp scandals.

Liebknecht, Wilhelm (1826-1900), German Socialist agitator and journalist, was born in Giessen. With F. A. Bebel he founded the *Demokratisches Wochenblatt*, and the attacks

on Bismarck appearing in its columns led to the imprisonment of both (1872-4).

Liebrecht, Felix (1812-90), German folklorist and linguist, was born in Namslau. His collection of monographs on folklore, *Zur Volkskunde* (1879), is a classic.

Liechtenstein, Principality of, a small independent sovereign state of Central Europe. The climate is mild, and the inhabitants are engaged chiefly in agriculture and stock-raising. The capital and seat of government is Vaduz. The reigning prince is Francis I. Since 1921 Liechtenstein has been included in the Swiss Customs Union, the posts and telegraphs being administered by Switzerland; p. 10,213.

Liège (Flemish *Luik*, German *Lüttich*), town and episcopal see of Belgium, capital of the province of Liège. The cathedral church was originally St. Lambert's, founded in 712, destroyed by the French republicans in 1794, and wholly removed in 1802. Since that date St. Paul's founded in 968 and completed about 1228, with a carved pulpit by Geefs, has been the church of the see. Among the remaining churches are two (St. Denis and Holy Cross) which date from the tenth century, and three (St. James', 1016-1528; St. Bartholomew's, 11th and 12th centuries; and St. Martin's, 16th century).

Situated in the center of the e. Belgian coal mining district, Liège is one of the first manufacturing cities in Belgium. The most important industry is the making of firearms and cannon.

History.—The history of Liège is a long struggle between the bishop-princes and the liberty-loving burghers of the city. The city was seized by Charles the Bold of Burgundy in 1467-8. It was again conquered in 1691 by the French, in 1702 by Marlborough, and once more by the French in 1792. The Congress of Vienna assigned the city and the episcopal territories to the Netherlands; but in 1831 they were incorporated in the new kingdom of Belgium.

The first serious conflict of the Great War was staged around Liège. It is generally conceded that the stubborn resistance of the Belgians at Liège delayed the main advance of the Germans for nearly a week; p. 169,560.

Liegnitz, town, Silesia, Prussia. The Church of SS. Peter and Paul dates from the 14th century. Liegnitz became part of Prussia in 1742, and here in 1760 Frederick the Great defeated the Austrians; p. 70,300.

Lien is an important legal term, most frequently signifying a right to retain possession of another's property in security of a debt or

other obligation. Sometimes, however, it denotes a right to charge certain specific property with the burden of a debt due by the owner. Liens may exist either at common law, or in equity, or at maritime law, or by statute, or by convention.

Liens may either be general, where the creditor has the right of retaining the property in security of all claims which he has against the owner, or at least those arising out of a particular line of business; or particular, where he has only such right in security of claims connected with the property affected. The most important equitable lien is that created over lands sold in favor of an unpaid seller.

Maritime law gives a ship owner a particular lien over goods conveyed by him for the freight due; and conversely, the owner of the goods has a lien over the ship for their value. If these be lost or destroyed in such a way as to render the ship owner liable. A lien may be created in favor of one of the parties to a contract by mere agreement among all concerned in cases where no such right would otherwise exist. Consult Henry's *Law of Liens & Pledges* (1914); Jones' *Treatise on the Law of Liens* (3 ed. 1914).

Lierre, or **Lier**, town, Antwerp province, Belgium. It has the fine Gothic Church of St. Gummar (1425-1557). The town shared the fate of Antwerp in falling to the Germans during the Great War (October, 1914); p. 26,000.

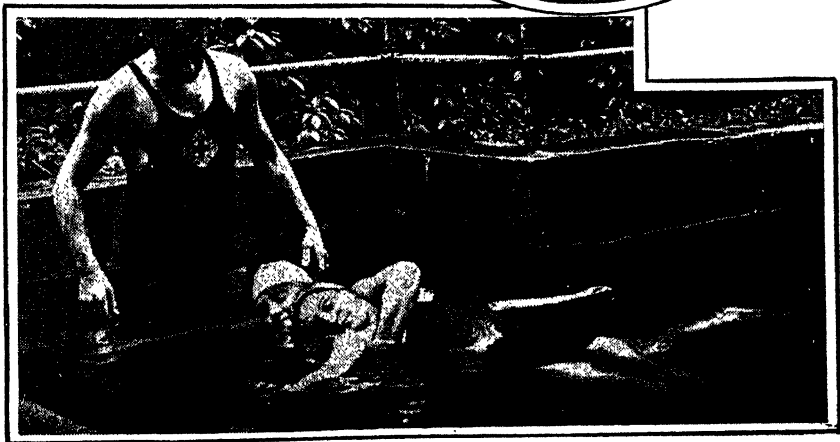
Lieutenant, a subaltern military officer whose duties are to assist the captain under whom he serves. Naval Lieutenant, a commissioned officer of the navy below the rank of lieutenant-commander and above that of ensign.

Lieutenant-Colonel, an officer next below the rank of colonel and above that of major, whose duties are to assist the colonel in command of a regiment.

Lieutenant-Commander, in the U. S. Navy, an officer below the grade of commander and above that of lieutenant.

Lieutenant-General, an officer next below the rank of general, and next above the rank of major-general, whose command is a field army of two or more divisions, or an army corps. This grade was created in the United States Army for the commander-in-chief on May 28, 1798, and abolished on March 3, 1799; revived on Feb. 15, 1855, and bestowed on W. S. Scott; revived in 1864, and bestowed successively on Generals Grant, Sherman and Sheridan; revived in 1895, and since held by a number of officers.

Lieutenant-Governor, an executive officer



Life Saving: Rescue and Demonstration Scenes.

of some of the States of the United States who ranks next to the governor, and who performs the latter's duties in case of death, absence, or disability.

Life. See **Biology**.

Life-Saving Apparatus embraces the appliances used for the preservation of life in cases of shipwreck, and includes Lifeboats, Cars and Rafts. Life Buoys, Life Preservers (belts and jackets), Life-Saving Guns and Rockets, and the subsidiary equipment of life-saving stations.

Lifeboats are specially designed for service in rough water and stormy weather. The most essential qualities of a lifeboat are buoyancy, stability, self-righting power, self-emptying ability, capacity for carrying passengers, speed against a heavy sea, and facility in launching and in taking the shore. Buoyancy is given by water-tight deck and floor, air cases round the sides on board, and air chambers fore and aft.

Life Buoys are appliances which may be cast into the water in order to aid in the rescue of drowning persons. The ring type is the one most commonly in use. For effecting rescues from the shore or from one vessel to another, the breeches buoy is usually requisitioned. This consists of a ring buoy, about 2½ ft. in diameter, to which short canvas breeches are attached. It is suspended by slings from a trolley that travels freely on a hawser stretched between the stranded ship and the shore; and it is hauled to and fro by means of lines.

Life Preservers are made to fit about the body, their buoyancy being derived from cork filled canvas or by the inflation of a rubber lining with air. In the United States, life preservers of an approved pattern are required by law on all passenger vessels.

The **Life Car** used in the American service is shaped like a covered boat 10 or 11 ft. long. It is made of galvanized sheet steel. It can be attached to a hawser and hauled through the water to and from the wreck, or operated like a breeches buoy.

In the larger passenger steamers it is difficult to carry conveniently sufficient boats for all the passengers and crew. To replace those boats which would of necessity be stowed in inconvenient localities.

Life rafts usually consist of two or more hollow metal cylinders or inflated rubber floats supporting a wooden grating or deck. The smaller ones are fitted with life lines and oars, and the larger ones with a jury mast.

Life-saving guns and rockets are employed to convey life lines and hawsers from the shore

to a wrecked or stranded vessel, and *vice versa*. American ocean-going steamers are required to have some approved means of firing lines to the shore, and the Cunningham rocket and the Hunt gun are used by many in this connection.

Life-Saving Service. In nearly all maritime countries there exist some organized means for assisting the shipwrecked from the shore. The Life-Saving Service of the United States is much larger than any foreign one, and, with the exception of the small services of Belgium and Denmark, it is the only one supported wholly by the government. In all other countries the services are maintained by private associations more or less assisted and controlled by the public authorities.

In Canada the work of maritime life saving is conducted by the Dominion government, both methods and equipment being patterned after those of the United States. There are about 50 stations on the coasts and Great Lakes, all well equipped.

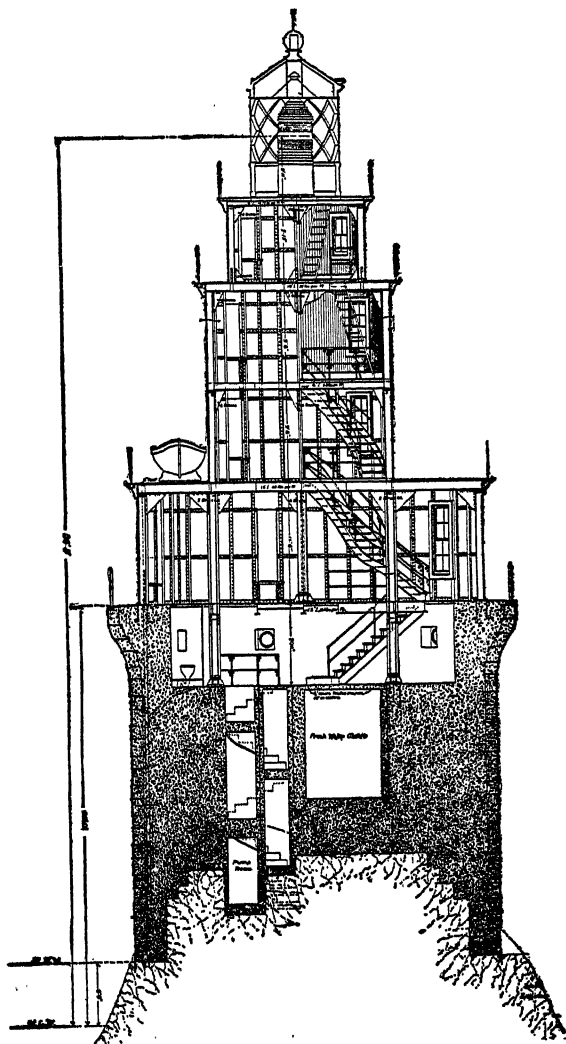
The United States Life Saving Service may be said to have had its origin as early as 1786, when the Massachusetts Humane Society first placed a number of isolated huts at the disposal of the State for the relief of persons shipwrecked on the coast. In 1848 the U. S. Government made the first appropriation for placing huts along the coast between Barnegat and Sandy Hook, but the first real advance was made in 1871, when an appropriation of \$200,000 was voted by Congress for establishing a service that should employ paid crews of experienced surf-men and thus dispense with the heroic but indispensable volunteer system. Subsequent legislation extended the work to include the entire Atlantic and Pacific coasts, as well as the lake coasts of the interior. By Congressional Act of January, 1915, the service was merged with Revenue Cutter Service into one organization known as the Coast Guard Service.

The life-saving stations, now known as coast guard stations, are located at points most dangerous to shipping and designated by names indicating their localities. Each station is provided with suitable life-saving apparatus (see **LIFE SAVING APPARATUS**), as well as signalling apparatus. The crew consists of six or more surfmen who are regularly put through a rigid drill and practice in the use of the various types of rescue apparatus, in signalling, and in the work of resuscitation. The service now includes airplanes. See **COAST GUARD SERVICE**, **U. S.**; **LIFE-SAVING APPARATUS**; **SAFETY AT SEA**; **MARINE DISASTERS**.

Ligaments are cords, bands, or membranous expansions of white fibrous tissue, which play an important part in the mechanism of joints: they pass in fixed directions from one bone to another, and serve to limit some movement of a joint, while they freely allow

rel-shaped expansions attached by their two ends to the bones entering into the formation of the joint (shoulder joint, hip joint).

Ligature, in surgery, is a thread or wire used for the purpose of occluding the circulation in a diseased or injured blood vessel,



Steel and Concrete Lighthouse. Mile Rock Lighthouse, San Francisco Harbor, Cal.

others. Ligaments are arranged in three classes: Funicular, rounded cords such as the external lateral ligament of the knee joint; Fascicular, flattened bands, such as the lateral ligaments of the elbow joint; Capsular, bar-

or of preventing hemorrhage or discharge from the pedicle of a tumor which has been removed. An external ligature in the form of a tourniquet or an elastic band is frequently applied to a limb to control hemorrhage either

after an injury or during an operation. See **FIRST AID**; **BLEEDING**.

Light is, primarily and subjectively, any effect on our sense of sight; secondarily and objectively, it is the changing condition in the external world which corresponds to or produces this sensation. Light is a particular kind of motion in a medium believed to fill all space and permeate all matter. (See **ETHER**.) The motion is a wave motion, and is propagated through free space with a speed of 186,000 m. a second. Through space occupied by matter the speed of propagation is reduced in a ratio depending upon the nature of the matter.

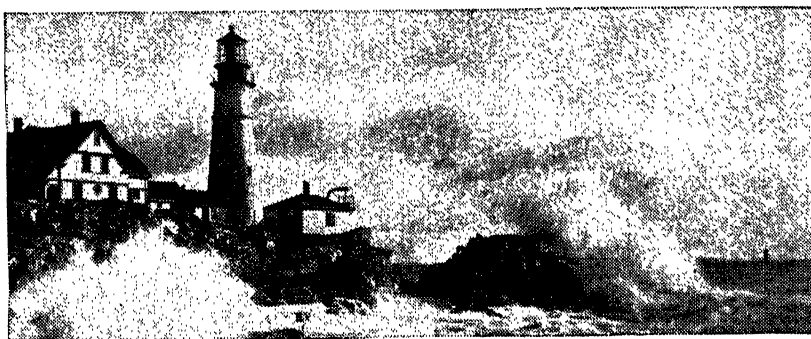
viding a single ray into two separate refracted parts. (See **POLARIZATION OF LIGHT**.)

Just as the ear cannot hear sounds whose frequencies of vibration lie outside certain limits (see **ACOUSTICS**), so the eye cannot perceive as brightness other waves whose wave lengths are longer than the wave length of red light, and shorter than that of violet light.

See **EYE**; **VISION**; **PHOTOMETRY**; **OPTICS**; **ABERRATION**; **SHADOWS**. Consult Crew's *Wave Theory of Light*.

Light, Standards of. See **Photometry**.

Light and Air, Easement of. In the United States the owner of land along a public highway has an easement of light and air



Lighthouse at Portland Head, Maine.

The changes which may occur in the character of a ray of light which falls upon a material surface or passes into or through a portion of matter are infinitely various. The direction of the ray is in general changed (see **REFLECTION AND REFRACTION**), and the changes are different for the rays of different color. (See **DISPERSION**; **SPECTRUM**.) Usually absorption takes place of selective character, so that certain constituents of the original ray are more absorbed than others, giving rise to all the variety of color present in nature. (See **COLOR**.) If the matter is transparent, the absorption is never complete; the ray emerges deprived of some of its original energy. (See **FLUORESCENCE**).

If the medium is a crowd of small particles, color effects are produced which are explicable only in terms of a wave theory of light. (See **DIFFRACTION**; **INTERFERENCE**.) The colors of soap films and the thin wings of certain insects are explained on the same principle of the mutual interference of contiguous rays of light. Then, again, there is the property possessed by many crystalline substances of di-

over it. This right was recognized in the famous New York Elevated Railway cases, where the elevated road was held not to be a proper use of the highway, and heavy damages were obtained by abutting property owners for infringement of their easements of light and air. A person has a right to construct windows overlooking the land of another, but the latter may obstruct the view and passage of air by building upon his own land. This easement may be extinguished by merger of estates, release, or abandonment. See **EASEMENT**; **PRESCRIPTION**.

Light Artillery. See **Field Artillery**.

Light Cure. See **Finsen**, **Niels R.**

Lighter, a large flat-bottomed boat used to load and unload vessels in harbors.

Lighthouse, a building erected on some conspicuous part of the coast from which a light is shown at night to guide mariners, and which serves as a landmark by day. Lighthouses are generally placed on salient points of the coast line, islands, isolated or sunken rocks, low promontories, and sand banks.

The most famous of ancient lighthouses was

the Pharos of Alexandria (see PHAROS); but until comparatively modern times, such public works were few and inefficient. The history of modern lighthouses dates from the building of the Eddystone Lighthouse in the English Channel, 14 m. from Plymouth, by John Smeaton in 1757-9.

In the United States, noteworthy towers of masonry have been erected on Minot's Ledge, at the entrance to Boston harbor; on Spectacle Reef, in Lake Huron; and on Tillamook Rock, in the Pacific Ocean, 20 m. from the mouth of the Columbia River.

In the lighting of lighthouses either metal or glass may be used for reflection. Reflection is either 'catoptric,' where metal only is used, and the rays by contact are reflected; or 'dioptric,' where glass alone is used, and where the rays are refracted. It may also be 'catadioptric,' when both glass and metal are employed. The first application of scientific lighting principles was in the parabolic reflector of Hutchinson of Liverpool in 1777. The light represented the focus of the parabola, and the reflector was parabolic.

In 1822 and the following years Augustine Fresnel brought about a revolution by introducing glass lenses, glass cylindrical refractors, and totally-reflecting prisms. His final apparatus was entirely constructed of totally-refracting prisms; and this arrangement is still the basis of lighthouse illumination all over the world.

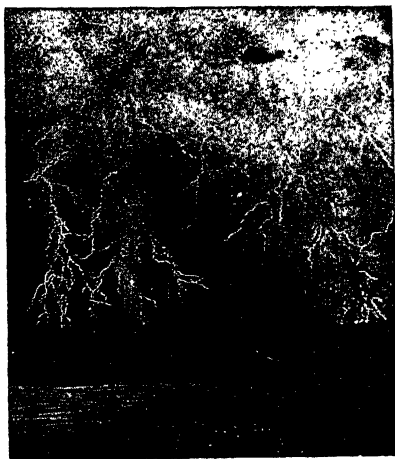
The different kinds of lights shown on lighthouses are as follows:—The fixed light. The revolving light, which comes into full view gradually, and as gradually disappears. The flashing light, which, at intervals of a few seconds, comes very quickly, though gradually, into view, and as suddenly disappears. The colored light. The intermittent light, which is suddenly turned on and off at fixed intervals. Intermittent light of unequal periods; for instance, fixed for two seconds, eclipsed for five, fixed for two, eclipsed for two, and then fixed for two as at first, and so on. The group flashing light, where two or more flashes are followed by an eclipse of some seconds. Fixed lights illuminating the whole horizon, but showing revolving or intermitten characteristics over certain areas. The differences are effected by masks arranged like venetian blinds. The intermittent flashing light, a succession of quick flashes followed by a dark interval.

Lighthouses are classified according to the diameter of the lenses, which in turn is determined by the distances at which they are

to be visible. In the U. S. government service there are six principal grades or 'orders.' In recent years radio apparatus and automatic lighting have been extensively introduced. The most powerful light in this country is now that of the lighthouse at Navesink, N. J., with 9,000,000 candle power.

See Heap's *Ancient and Modern Lighthouses* (1889); Johnson's *Modern Lighthouse Service* (1889); Stevenson's *Lighthouse Construction and Illumination* (1881); and the light-lists and sailing directions published by the United States Lighthouse Board and the United States Naval Hydrographic office.

Lightning, the bright flash characteristic of thunderstorms. Its identity with an electric spark, long suspected, was demonstrated in 1752 by Franklin, who by means of a kite tapped a thundercloud of some of its charge. The first stage in the genesis of a thunder-



Photographs of Lightning Flashes.

storm is the establishment of a difference of electric potential in the atmosphere. The discharge takes place in the form of one or more lightning flashes, and the noise of the discharge is heard in the thunder-roll. The two familiar types of lightning are forked lightning and sheet lightning, and these probably correspond to the spark discharge and the glow discharge from an electric machine. A curious and comparatively rare form of lightning is the ball lightning, which has the appearance of a luminous ball floating through the air until it comes in contact with a solid body, when it explodes sharply.

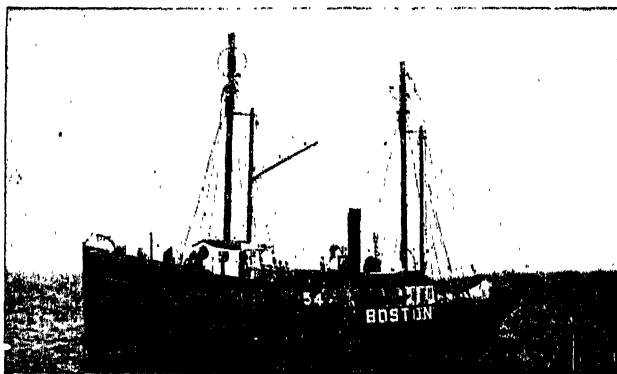
The violence of the explosion with which a

lightning flash passes constitutes a source of danger both to life and to buildings. Protection to the latter is secured by the use of lightning conductors, which are a means for facilitating the discharge from the electrified cloud to the earth. A flat strip or round rod of metal preferably copper rather than iron to prevent rust, passes from the earth to above the highest point in the building, and terminates in one or more spikes which ensure quiet discharge of strong electrical currents toward or from the earth.

Lightning Arresters. (See also **Telegraphy, Telephony and Lightning**). A device for protecting telegraph and telephone wires from lightning discharges. In a simple

still retain them; Protestant Churches generally gave them up at the time of the Reformation, although in the Anglican Church candles are still frequently used on the altar.

Lightship, a vessel moored out at sea with a light to mark a bank, shoal, or place dangerous to mariners. The most notable American lightships are on Nantucket Shoals and Hatteras Shoals. Like the other modern lightships for offshore stations, they are screw steamers, built for service as lightships, but able to make a fair rate of speed if they break adrift from their moorings. They are now equipped with radio-telegraph and fog signals as well as electric-lighting systems. See **Lighthouse**.



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Lightship in Boston Harbor, Mass.

form one end of a thick wire or rod is connected to the earth, and the other end brought close to the line, with a gap so narrow that the lightning will easily jump across, though the smaller electrical pressure of the system is unable to do so. In another type of arrester the electro-magnet pulls away one of the poles, thus lengthening the gap until the arc breaks, this is found very useful in large installations.

In radio a lightning arrester is the term used for a spark-gap connected between aerial and earth to provide low-resistance path to earth while a spark is maintained, thus protecting a receiving set from a lightning discharge.

Lights, in public worship, were used in the Jewish tabernacle and in the Temple. There is no direct evidence that they were retained as a part of the Christian ceremonial during the first three centuries. In the fourth and following centuries they were almost universal. The Roman Catholic and Eastern Churches

Light-Year, the distance traversed by light in one year, equivalent to nearly six billion m., is the unit adopted for the measurement of sidereal space.

Lignin, or woody fibre, is the product into which the cellulose first formed in a plant is converted, by incrustation with other compounds, probably belonging to the aromatic series, when changed into wood in the process of lignification.

Lignite, or 'brown coal,' is mostly light, friable, and porous, showing its vegetable origin by the retention of the woody structure, or sometimes also of the shapes of leaves, stems, and pieces of bark. Chemically they represent an intermediate stage between wood and coal. Nearly all lignites are of recent geological age as compared with coals, though they may be converted into coal by the heat of igneous masses, or by pressure and earth movement. See **COAL**.

Lignum Rhodii, the wood of *Convolvulus scoparius* and *C. Floridus*, shrubby species of bindweed, natives of the Canaries.

Lignum Vitæ, the wood of a West Indian tree, *Guaiacum officinale*, the duramen or heartwood of which is of a dark greenish color, and very hard, heavy, and cross-grained—extensively used for machinery, rollers, pestles, ships' blocks, etc. It contains a quantity of the resin of guaiacum, by virtue of which it is much employed in pharmacy. (See GUAIA-CUM.)

Liguori, Alfonso Maria di, Saint (1696-1787), a Neapolitan of good family, one of the greatest Roman Catholic writers of the 18th century, and the founder of the Congregation of the Redemptorists (1732). He was canonized by Gregory XVI. in 1839, and for his scholarly exposition of the doctrines of the immaculate conception and infallibility Pius IX. named him a doctor of the church (1871). (See also REDEMPTORISTS.)

Liguria, div. of ancient Italy, bounded on the w. by the river Varus and the Maritime Alps, on the e. by the river Macra, separating it from Etruria, and on the n. by the Po. Its inhabitants—called by the Greeks Ligyes, by the Romans Ligures—were subdued by the latter about 150 B.C.

Ligurian Republic, the name given to the republic of Genoa in 1787 by Napoleon. Up to 1802 it was ruled by the Directory. In 1805 it was incorporated with the French empire.

Ligustrum, a genus of plants, order Oleaceæ, characterized by opposite, entire leaves, and by terminal panicles of funnel-shaped flowers, followed by two-celled berries. *L. vulgare* is the common European privet.

Li Hung Chang (1823-1901), Chinese statesman, who first became known to Europeans through his association with Gordon in the suppression of the Taiping rebellion (1863). He subsequently became the viceroy of Tien-tsin, and held this position till his death, also filling in the course of his career other high imperial offices. During the war with Japan (1894) he was for some time commander-in-chief of the Chinese forces, and on its conclusion negotiated the treaty of peace with the Mikado (1895). He visited the principal nations of Europe in 1896, and also made a tour of the U. S., and was everywhere received with cordiality. In 1900 he was appointed by the dowager-empress of China to negotiate with the allies for the restoration of peace after the 'Boxer' massacres and the occupation of Peking by the powers. See Douglas's *Li Hung-chang* (1895).

Lilac, or **Pipe Tree**, a name given to shrubs belonging to the genus *Syringa*, order Oleaceæ. They are natives of temperate Europe and Asia, and are among the most valuable of our hardy cultivated shrubs. The flowers are small, with bell-shaped calyces and tubular panicles. Many of the species and varieties possess a delicate and delightful fragrance. The common lilac, *S. vulgaris*, of which there are violet, white, blue, and rose-colored varieties, is perhaps the species most frequently seen.



Lilac (Syringa vulgaris).

1, Flower section.

Liliaceæ, a natural order of plants, mostly herbaceous, with bulbous roots, of which a very large proportion are garden plants, valued either for the beauty of their flowers or for the flavor of their bulbs or shoots.

Lilienthal, David Eli (1899-), lawyer, was born in Morton, Ill. He was a member of the Wis. Public Service Commission, 1931. Since 1933 he has been a director of the Tenn. Valley Authority. He is also president and director of Electric Home and Farm Authority, Inc., and director of the Tenn. Valley Associated Cooperatives, Inc.

Lilienthal, Otto (1848-96), German aviator, was born in Anklam, Prussia. He became interested in aviation and in attempting to discover a method of flying in imitation of the flight of birds, was killed. His *Birdflight as the Basis of Aviation* was published in 1911.

Lilith, a female demon of Hebrew folklore, supposed to be hostile to children, and to

adults sleeping alone. In rabbinical literature, Lilith is regarded as Adam's first wife. (See ADAM.)

Liliuokalani (1838-1917), queen of Hawaiian Islands, wife of John O. Dominis, a native of the United States, succeeded her brother, Kalakaua (1891). The queen was deposed and a republic proclaimed (1894).



Lilium Canadense

Lille, fortified town, France, in the department of Nord, near the Belgian frontier; 66 m. s.e. of Calais. It is situated in a level district of the Deule, and is a modern well built town. Among its buildings may be noted the citadel (designed by Vauban), in the n.w. part, the church of Notre Dame de la Treille, since 1913 used as the cathedral, the town hall, the bourse, and the Palais des Beaux Arts, which contains exceptionally rich art collections. It is one of the chief industrial towns of France, and is specially noted for its textile factories, in which linens, cottons, velvets, ribbons, and woolen goods are produced. During the Great War it was the largest French town which fell into German hands. After a three-day bombardment in October, 1914, it was forced to capitulate to the German army in whose hands it remained until 1918. In 1916 25,000 inhabitants of Lille were deported and the town suffered greatly from the bombardment of 1914, many streets and buildings being completely ruined; p. 201,921.

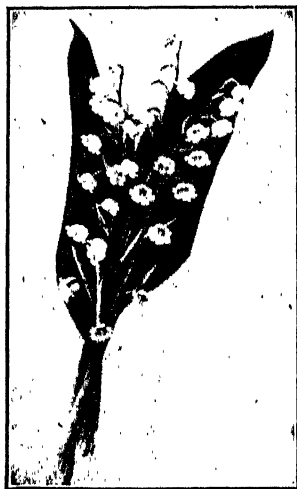
Lilliput, an imaginary country on the shores of which Gulliver, the hero of Dean Swift's *Gulliver's Travels*, was wrecked. The inhabitants were so diminutive—the height of

a finger's length—that they regarded Gulliver as a monstrous giant.

Lily (*Lilium*), a genus of hardy, half-hardy, and tender bulbous plants, of the order Liliaceæ. Most of the species have beautiful flowers, and are therefore valued as garden or greenhouse plants. The flowers are borne either solitary at the top of the stems, or in a loose raceme. The perianth is usually more or less funnel-shaped, with free segments. Among the best known and most valued species are the following. *L. tigrinum*, the common tiger lily, bears many-flowered racemes of spotted orange-red flowers in late summer. *L. candidum*, the St. Joseph's lily, or Madonna lily, with racemes of pure white flowers in summer, is perhaps the most commonly cultivated of lilies, and also one of the most beautiful. The lilies of eastern North America have both nodding and erect flowers, of an orange-red or yellow hue.

Lily, Spear or Gigantic, a name sometimes given to *Doryanthes excelsa*, order Amaryllidaceæ, a tall-growing Australian plant, often reaching 20 ft. in height.

Lily of the Valley, the popular name of *Convallaria majalis*, of the order Asparagaceæ, a common garden plant found wild in European countries. It is largely cultivated in Ger-



Lily of the Valley

many and quantities are exported annually. It has beautiful drooping, white, bell-like flowers born in a long unilateral cluster, which have a delicious and unique fragrance. The lily of the valley is a perennial plant, flower-



LILAC

ng in late spring but is often forced. It propagates itself through runners and spreads rapidly. It is hardy and easily grown in gardens.

Lima, capital of Peru and of Lima province, on the left bank of the Rimac River. It is the leading city of Peru, the seat of the national university of San Marcos and of a bishop. It is well laid out, with shaded streets and many public squares, monuments, and gardens. The cathedral, the most imposing building in the city, was overthrown by the earthquake of 1746, which destroyed the greater part of the city, and has only recently been completely restored. The leading industries are cotton spinning and weaving, distilling, and the manufacture of cloth, tobacco, chocolate,

an area of 847 sq. m. It is drained by the Meuse. The marshy district of Peel occupies a large portion of the n. of the province. There are important coal mines, but agriculture is the leading industry. Maastricht is the capital; p. 543,251.

Limbus, a name in Roman Catholic theology applied to the abode of souls who, from no fault of their own, are denied entrance into heaven.

Lime, or **Calcium Oxide**, a chemical compound produced by heating calcium carbonate to a temperature high enough to drive off the carbonic acid ($\text{CaCO}_3 = \text{CaO} + \text{CO}_2$). Pure lime, known as quicklime or burned lime, is extremely infusible, and when water is add



Elmendorf Photo, Copyright Ewing Galloway, N. Y.

Limerick, Ireland: Thomond Bridge.

matches, paper, and soap. Lima (a corruption of Rimac) was founded in 1535 by Pizarro; p. 370,000.

Lima Bean. See **Bean**.

Limasol, seaport, on the southern coast of Cyprus, 38 m. s.w. of Larnaca. The chief building of interest is an ancient chapel in which Richard Cœur de Lion is said to have married Berengaria of Navarre; p. 13,300.

Lima Wood. See **Brazil Wood**.

Limbourg, or **Limburg**, province in the northeastern corner of Belgium, bordered on the e. by the Meuse; with an area of 930 sq. m. Extensive coal deposits have been found in the district known as the Campine. Hasselt is the capital; p. 366,000.

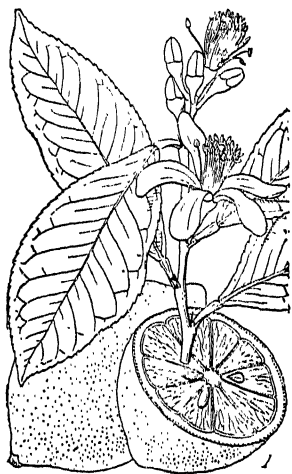
Limburg, province of the Netherlands, with

ed crumbles down into voluminous white powder, calcium hydroxide or, as it is commonly called, 'slaked lime,' much heat being evolved in the process. It is used for a variety of purposes, as in the production of raw sugar, the making of cement and mortar, in medicine, and for agricultural purposes. When intensely heated, it produces the lime light.

Slaked lime is slightly soluble in water, forming an alkaline solution known as lime water. 'Milk of lime' is a thick liquid consisting of slaked lime suspended in water, and is the source of the hydroxide radical. See **CALCIUM**. Consult Q. A. Gillmore's *A Practical Treatise on Limes*.

Lime (*Citrus medica*, var. *acida*), small, sour fruit similar to the orange and lemon. The

tree seldom exceeds 8 ft. in height and has irregular spreading branches. The commonest variety is the small West Indian lime which chiefly supplies American markets. Limes are useful as a source of citric acid, and of lime juice, a valuable antiscorbutic. They are cultivated much like lemons and oranges.



Lime Fruit (*Citrus medica*).

1, Section.

Lime Light, or **Calcium Light**, a brilliant white light obtained by the incandescence of lime in an oxyhydrogen flame. It was invented by Thomas Drummond in 1824. The lime light has now been generally replaced by the electric arc light.

Limerick, co. of the province of Munster, s. of the Shannon, with an area of 1,062 sq. m. The soil is in general fertile, especially in the district of the Golden Vale, stretching from about the mouth of the Maigue into Tipperary. Agriculture and dairy-farming are important. The county town is Limerick; p. 100,895.

Limerick, city of co. Limerick, Irish Free State, on the Shannon. The principal buildings are the Cathedral of St. Mary (Anglican), a Gothic edifice founded in the 12th century, St. Mainchin's, and the castle built by King John, a fine example of Norman architecture. The 'treaty stone', where the Treaty of Limerick (1691) was signed, is preserved on a pedestal beside Thomond Bridge; p. 39,448.

Limestone, rocks consisting essentially of calcium carbonate, but rarely altogether pure. They vary from a soft powdery chalk to a substance of moderate hardness and density.

A number of varieties of limestone are recognized, differing in texture, chemical composition, and mode of origin. The crystalline variety, composed of interlocking grains of calcite, is known as marble. Chalk is a fine white limestone formed from the accumulated shells of minute foraminifera; marl is a soft variety deposited in lakes and ponds; tufa, a cellular limestone formed by springs; hydraulic limestone, an aluminous variety, which when burned has the property of hardening under water. Carbonate of lime in solution is found in all rivers, lakes, and seas. In evaporation the carbonate of lime remains uninfluenced, becoming gradually concentrated, until it has supersaturated the water, when a precipitation takes place. In this way are formed the stalactites which hang icicle-like from the roofs of limestone caverns, and the stalagmites which rise as columns from their floors. Limestones are much used in building, in the preparation of lime and cement, and as a flux in metallurgical operations. See CHALK; MARBLE.

Lime Tree. See Linden.

Lime Water, or **Liquor Calcis**, is prepared by shaking up pure slaked lime in distilled water, and decanting. It contains half a grain of calcium oxide (CaO) in one fluid ounce.

Limicolæ, a large sub-order of birds of the order *Charadrii-formes*, including the Plover Snipe, Sandpiper, Curlew, Jacana, and their allies, and often known as 'shore birds' or 'beach birds.' Most of the species are small, with long slender bills, and rather long legs. They have powerful wings, and are noted for their extensive migrations.

Limit. If we have an endless sequence of magnitudes, and a point in the sequence can always be found beyond which every member differs from some quantity *L* by a quantity less than any assignable magnitude ϵ , then *L* is called the limit to the sequence. The theory of limits is of the utmost importance in rigorous mathematics. The differential coefficient is itself the limit of the ratio of two quantities as they tend to become zero. See CALCULUS, INFINITESIMAL.

Limitation, in the law of real property, signifies words which define or limit the nature and extent of interest or estate which a grantee is to take. Thus in a grant to *A and his heirs* the words italicized show that the estate conferred is one of inheritance or fee simple. The same effect is produced in most of the United States by a grant to *A* simply, though at common law this only confers an estate for life. A grant to *A and the heirs of his body* or to *A*

and the heirs male of his body confers an estate in tail general or tail male respectively. On the failure of heirs of the body or heirs male of the body of the grantee, the estate returns to the grantor.

In judicial practice, *Limitation of Actions* denotes the curtailment of the right to sue through lapse of time. See LIMITATION, STATUTES OF.

Limitation of Armaments, Conference on, Nov. 12, 1921-Feb. 6, 1922, a conference called by President Harding of the United States to meet in Washington, on Nov. 11, 1921, to consider 'the subject of the limitation of armament, in connection with which Pacific and Far Eastern questions will also be discussed.' Preliminary invitations were sent to Great Britain, France, Italy, and Japan on July 10, 1921, and the formal call was issued on Aug. 11, 1921. A special invitation was extended to China to participate in the discussion of Far Eastern and Pacific problems, and Belgium, Holland, and Portugal were invited in view of the extent of their interests in the questions involved. (See also DISARMAMENT).

The Conference met for its open sessions in the Continental Memorial Hall of the Daughters of the American Revolution, and for its closed sessions in the Pan-American Building, in which also the various committee meetings were held.

The United States was represented by the following principal delegates, Charles Evans Hughes, Secretary of State. Elihu Root, former Senator and ex-Secretary of State. Henry Cabot Lodge, Senator from Massachusetts. Oscar W. Underwood, Senator from Alabama.

The work of the Conference was carried on through seven plenary sessions through private sessions, and through two committees, one on Armament Limitation, consisting of the heads of the delegations of the five great powers; and one on Far Eastern Affairs consisting of members appointed by the heads of all the delegations represented at the Conference, nine in number. Charles Evans Hughes, U. S. Secretary of State, was elected Chairman of the Conference at its first session. The official Agenda for the Conference, proposed by the United States and accepted by the nations participating, limited and defined the questions to be discussed as follows: Limitation of naval armament; rules for control of new agencies of warfare; limitation of land armaments; Pacific and Far Eastern questions, including questions relating to China, Siberia, and the mandated islands.

The question of the limitation of Armament

was the first to engage the attention of the Conference, being presented at the First Plenary Session (Nov. 12) by Secretary Charles Evans Hughes in a notable speech. His proposals created a profound impression throughout the world, and met with an immediate response from the delegates to the Conference. These proposals were later embodied in the *Five Power Naval Limitation Treaty*, which provided also for naval limitation in Italy and France, and which was signed by the delegates on Feb. 6, 1922. By the terms of this treaty, which is to remain in force until Dec. 31, 1936, or longer, the contracting powers agree to abandon their respective capital ship-building programs and to construct and acquire no new capital ships except replacement tonnage, which is limited as follows: 'not to exceed in standard displacement, for the United States, 525,000 tons for the British Empire, 525,000 tons; for France, 175,000 tons; for Italy, 175,000 tons; for Japan 315,000 tons.

Other phases of the limitation of armament considered by the Conference included submarine warfare, auxiliary craft, chemical warfare, and aircraft. Lord Lee of Fareham, First Lord of the British Admiralty, made a strong plea for the complete abolition of underseas craft, but while the other delegates expressed themselves as emphatically opposed to the illegitimate use of the submarine against merchant shipping, the French delegation, in particular, stood out for the retention of the submarine. The question of limiting submarine tonnage being thus closed, Elihu Root of the American delegation presented a series of resolutions designed to prohibit the use of submarine craft as commerce destroyers. These resolutions were adopted and were later, with certain modifications, included in the *Five Power Treaty on the Use of Submarines and Chemical Warfare* (signed Feb. 6, 1922).

Resolutions prohibiting the employment of 'asphyxiating, poisonous, or other gases and all analogous liquids, materials, and devices,' as unanimously adopted at the session of January 7, were also included in this treaty.

A resolution was adopted providing for the appointment of a commission of not more than ten members, representing the United States, Great Britain, France, Italy, and Japan to study and report upon the following questions:

(a) Do existing rules of international law adequately cover new methods of attack or defense resulting from the introduction or development, since the Hague conference of 1907, of new agencies of warfare?

(b) If not so, what changes in the existing rules ought to be adopted in consequence thereof as a part of the law of nations?

No agreement was reached on limitations of land armament, the third item in the agenda.

The first step toward the clarification of the Far Eastern situation was taken on Nov. 16, 1921, when the Conference met in private session as a Committee of the Whole on Pacific Problems and heard from Dr. Alfred Sze, the principles which China believed should be applied in the determination of questions relating to that country.

Outstanding accomplishments were the unanimous adoption of the Root resolutions: to respect the sovereignty, the independence and the territorial and administrative integrity of China, and to provide the fullest and most unembarrassed opportunity to China to develop and maintain for herself an effective and stable government. These resolutions were embodied in the Treaty on Chinese Integrity approved at the final session of the Conference, as was also a clause embodying the policy of the open door, and binding the signatory powers not to seek any arrangement which might purport to establish in favor of their interests any general superiority of rights with respect to commercial or economic development in any designated region in China, or any such monopoly or preference as would interfere with commercial or industrial undertakings on the part of nationals of their powers.

By the terms of the treaty, also, the powers agreed not to support any agreements by their respective nationals with each other designed to create spheres of influence or to provide for mutually exclusive opportunities in Chinese territory, while China undertook not to exercise or permit unfair discrimination of any kind throughout her railway system.

The Shantung controversy was the subject of a separate parley between the Chinese and Japanese delegates. On February 4, 1922, the Shantung Treaty, looked upon as one of the most important outcomes of the Conference, was signed. The treaty provided for restoration to China of the former leased territory of Kiao-Chau (details of the transfer to be arranged by a joint commission); for the withdrawal of Japanese troops from the territory; and for transfer to China of the Tsin-anfu Railway and its branches and appurtenant properties, in consideration of the payment by China of the actual value of the railway properties.

The first great step toward a solution of Pacific Problems was taken on Dec. 10, 1921 when U. S. Senator Lodge announced the conclusion of a treaty between the United States, the British Empire, France, and Japan 'with a view to the preservation of the general peace and the maintenance of their rights in relation to their insular possessions and insular dominions in the region of the Pacific Ocean.'

December 13, the day upon which the Four-Power Treaty was signed, saw also the announcement of the Japanese-American agreement concerning Yap and the other mandated islands of the Northern Pacific. These assured the United States of free access to Yap in all that relates to the operation of the Yap-Guam cable or of any cable to be laid hereafter by the United States or its nationals, and of similar rights and privileges with respect to radio-telegraphic service.

The closing session of the Conference was held on Feb. 6, 1922. Five treaties were signed at this time, and President Harding addressed the Conference, summarizing the accomplishments for which it was notable. The conference also marked the conclusion of the previously existing treaty between England and Japan. The good effect of the conference was upset however when Japan subsequently asserted a right to naval parity, despite the conference agreement setting a ratio of 5-5-3 for new construction for the United States, Great Britain and Japan, and on December 29, 1934, Japan served notice of her intention to abrogate the Washington treaty on Dec. 31, 1936.

By 1939 there was little to indicate that any country was being held to any naval limitations other than its means to finance and facilities to construct.

Limitation, Statutes of, prescribe the period after which the remedy of a right of action is barred by lapse of time. 'An act for limitation of actions and for avoiding suits at law,' was passed in England in 1623. This became famous as the 'Statute of Limitations,' and is the basis of modern legislation on the subject.

Statutes of limitation of actions have been enacted in all the United States. Some general rules which prevail, with slight modifications, may be here considered. A statute of limitation does not destroy a right; it merely effects the remedy. It is, therefore, a matter of court procedure. The statute of limitation enforced is that of the State in which the action is tried, regardless of the limit obtaining where the debt was contracted. The period of limitation for actions prosecuted in Federal

courts, though under the laws of Congress, varies in the different States. In criminal proceedings on the part of the United States, Congress has prescribed the period of limitation as six years.

Certain classes of equitable claims have been included by a number of States in the operation of the statute; and where the jurisdiction is concurrent with that of a court of law, the court of equity is generally considered to be bound by the statute. Statutes limiting the time in which criminal prosecutions can be commenced are also common.

The types of civil action controlled by statutory limitation include both real and personal cases. Under the statute, open and notorious adverse possession of land for twenty years, claiming title against all the world, will vest absolute title in the occupant. Cases in which the government is concerned have comparatively long periods. Consult Wood's *Limitations of Actions*.

Limited Liability. In law, this phrase refers to the limitation of a person's liability for debts and obligations in business. The liability of stockholders of corporations, and special members of 'limited partnerships,' is defined by statute in most of the States. See CORPORATION; PARTNERSHIP.

Limnæus, or **Lymnæus**, a genus of pulmonate Gasteropods, living in fresh water in all parts of the world, and feeding on vegetable matter; it includes many of the common Pond Snails. The shell is thin and pale, capable of containing the whole animal when retracted in danger or buried in the mud during drought.

Limnanthemum, a genus of aquatic plants of the buckbean family, with cordate leaves and beautiful yellowish-white flowers. The indigenous American species, *L. lacunosum* and *L. aquaticum*, are called 'Floating Heart,' and are found in ponds.

Limnanthes, a genus of hardy Californian annual plants, order Geraniaceæ.

Limoges, capital of the department of Haute-Vienne, France, on the River Vienne. Its most imposing building is the Gothic Cathedral of St. Etienne, begun in the 13th century and completed in 1851. There are remains of a Roman fountain and amphitheater. The enamel work for which Limoges was formerly celebrated, is now no longer carried on. The staple industry is the manufacture of porcelain. Limoges was an important town under the Romans, and in spite of plagues, fires, and sieges, from all of which it suffered severely, it is still a place of note. It had its

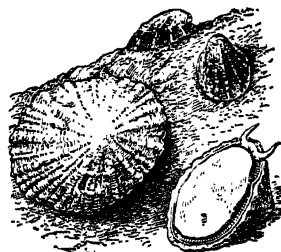
own mint from the 4th century down to 1837; p. 98,209.

Limon, **Port Limon**, or **Puerto Limon**, seaport, Costa Rica. Central America, on the Caribbean Sea. There is an excellent harbor with good wharfage facilities, and regular steamship connection with American and European ports. Exports include coffee, tropical fruits, rubber, dyewoods, and hats; p. 32,278.

Limonia, a genus of tropical Asiatic shrubs of the natural order Rutaceæ.

Limonite, or **Brown Hematite**, the hydrated oxide of iron ($2\text{Fe}_2\text{O}_3\cdot 3\text{H}_2\text{O}$), occurring in fibrous, earthy, stalactite mammillary, porous, or concretionary masses, and often as pseudomorphs formed by weathering of other minerals, such as pyrites or marcasite; but never in crystalline form. It is black or hair brown, and the streak or fine powder is yellow, distinguishing it from hematite; specific gravity, 3.8, hardness = $5\frac{1}{2}$. Limonite is formed from the decomposition or alteration of other minerals containing iron, and carries, when pure, about 60 per cent. of iron. The impure variety is ground for paint, and furnishes the pigments ochre and sienna.

Limpet, a genus of gasteropod molluscs, familiar objects between tide marks on rocky coasts. The animals are covered by a conical shell, with the apex directed slightly forward, and remain firmly fixed when the tide is out, adhering by the large oval or circular foot, which acts like a vacuum



Limpets.

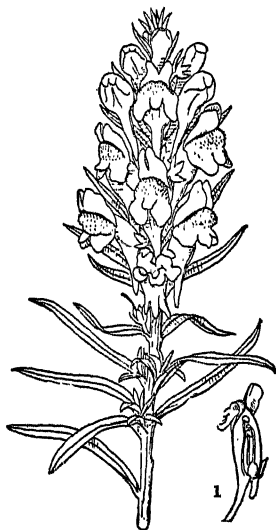
sucker on the rock. In the United States, the name is extended to some allied molluscs, as the Key-Hole Limpet (*Fissurella*) and the Slipper Limpet (*Crepidula*).

Limpopo, **Innampura**, **Crocodile**, or **Oori**, a river of South Africa. Rising in the Magaliesberg, w. of Pretoria, and flowing n.w. to Marico Drift, it follows a winding course n.e. and e. separating Bechuanaland and Rhodesia from the Transvaal. At the

Limvuba confluence it enters Portuguese East Africa, through which it flows s.e., and discharges, after a total course of about 1,000 m., into the Indian Ocean. Its banks are heavily wooded and picturesque.

Linacæ, an order of herbs and shrubs, bearing regular, hermaphrodite flowers with persistent sepals and petals which fall soon after expansion. *Linum usitatissimum*, the flax plant, is the source of most of the linseed oil and linen of commerce. See FLAX.

Linaria, a genus of hardy plants belonging to the order Scrophulariaceæ, widely distributed, mostly in the northern hemisphere. A common species along roadsides is the Yellow Toad Flax, *L. vulgaris*, popularly known as 'Butter-and-Eggs.'



Linaria vulgaris.

1, Section of flower.

Lincoln, city, England, capital of Lincolnshire, is situated on the River Witham. It is an important railroad center and has extensive canal communications. It is very ancient, is irregularly laid out, and contains many interesting specimens of early architecture. The chief glory of Lincoln is its Cathedral, one of the finest in England, erected between 1075 and 1501. In the central tower is the famous bell, 'Great Tom of Lincoln;' p. 66, 246.

Lincoln, city, capital of Nebraska, co. seat of Lancaster co. Prominent buildings are the Capitol, Federal Building, Court House, and the Carnegie Library. The city is the

seat of the University of Nebraska and the State Agricultural College. Lincoln is the market and shipping point of a fertile agricultural and dairy region, and also has many manufactures. The district was originally opened by the gold seekers of 1849; the first settlement was made in 1859, and was called Lancaster. In 1867, when the city was chosen as the site for the State capital, it was renamed in honor of Abraham Lincoln; p. 81, 984.

Lincoln, Abraham (1809-65), American statesman and national hero, the 16th President of the United States, was born in what is now Larus (then Hardin) co., Ky, on Feb. 12, 1809. During successive generations the family moved to New Jersey, Pennsylvania, and Virginia. Samuel's great-grandson rested in Virginia; his son, Abraham, followed the pioneer Daniel Boone to Kentucky, and while clearing a farm in the forest was killed by Indians in 1784. Abraham's son, Thomas, then but six years old, grew up without education, and in 1806 married Nancy Hanks, a woman of true nobility of character. Abraham, the future President, was their second child. Abraham learned the little that was taught in the backwoods schools, and was employed in rough farm work until at the age of 19 he took a cargo on a flat boat to New Orleans. His first close view of slavery at this time made a lasting impression on his mind. When Lincoln was 21 his father removed to Central Illinois, where the son assisted in felling trees, building another log cabin, and splitting rails for fences. Being defeated as a candidate for the legislature, he purchased a small store, but its failure left him burdened with debt. However, he was made village postmaster, and also deputy to the county surveyor, and the light duties allowed him time to study law and grammar. Elected to the legislature in 1834, he served until 1842, when he declined further nomination. He had become leader of the Whigs, and was influential in having the State capital removed in 1839 from Vandalia to Springfield, where he had fixed his residence. Thither, too, came Mary Todd (1818-82), the daughter of Robert Todd of Lexington, Ky., and in November, 1842, she was married to the rising lawyer.

In 1846 Lincoln was elected to Congress, but his service was limited to a single term. Professional work was steadily drawing him from interest in politics when in 1854 Stephen A. Douglas, by his Kansas-Nebraska

bill, repealed the Missouri Compromise of 1820, and reopened the question of slavery in the Territories. The bill roused intense feeling throughout the North, and Douglas resolved to defend his position in a speech at the State fair at Springfield in October. Lincoln, invited by his Whig friends to reply, delivered on the same day a speech which first fully revealed his power as a political debater. When the Republican Party was organized in 1856 to oppose the extension of slavery, Lincoln was its most prominent leader in Illinois. At its first National Convention in the same year the delegates of his State presented him as a nominee for the Vice-Presidency. But he did not attain a national reputation until 1858. Then Douglas, seeking re-election to the U. S. Senate, began a canvass of Illinois in advocacy of his views of 'popular sovereignty.' Lincoln, as candidate for the same position, arranged with Douglas for a series of debates. The contest attracted the attention of the whole country; but though the general verdict was in favor of Lincoln and his cause, the peculiar arrangement of the legislative districts gave Douglas the immediate advantage, and secured his election. In another memorable oration in Cooper Union, New York, in February, 1860, Lincoln proved that the founders of the republic had desired the restriction of slavery. In May of that year the Republican Convention was held in Chicago, and on the third ballot he was nominated for the Presidency. After an intensely exciting campaign Lincoln received a popular vote of 1,866,462. The pro-slavery leaders forthwith put in execution their plans for the secession of their States. South Carolina moved first, and with the six Gulf States formed, in February, 1861, the Confederate States of America. Lincoln's inaugural address on March 4 declared the Union perpetual, argued the futility of secession, expressed his determination that the laws should be faithfully executed in all the States, deprecated the impending evils, and made a touching appeal to all friends of the Union. The chief places in the Cabinet were given to W. H. Seward of New York (Secretary of State) and Salmon P. Chase of Ohio (Secretary of the Treasury). Edwin M. Stanton was made Secretary of War in 1862.

On April 12, 1861, the Confederate General Beauregard attacked Fort Sumter in Charleston Harbor. The Civil War being thus commenced, Lincoln called a special

session of Congress, summoned 75,000 militia for three months, and ordered the enlistment of 65,000 regulars for three years. On Sept. 22, 1862, just after McClellan's victory at Antietam, Lincoln proclaimed that on and after Jan. 1, 1863, all slaves in States or parts of States then in rebellion should be free. On the following New Year's Day the final Emancipation Proclamation was made. This greatest achievement of his administration was completed by the passage of the Thirteenth Amendment of the Constitution, which he planned and urged, and which was fully ratified in December, 1865. In July, 1863, Grant's capture of Vicksburg restored to the Union full control of the Mississippi River. In November of that year, at the dedication of the National Cemetery at Gettysburg, Lincoln delivered his famous Address (see GETTYSBURG ADDRESS). In the Republican Convention at Baltimore in June Lincoln was unanimously nominated for a second term. In his second inaugural address, in March, 1865, Lincoln rose above the ordinary range of such occasions, and like an inspired prophet set forth the profound moral significance of the tremendous war which he saw drawing to a close.

Lincoln returned to Washington to consider the new problems presented by the overthrow of the Confederacy. But his work was already finished. While seeking relaxation with his family at Ford's Theatre he was assassinated (April 14, 1865) by John Wilkes Booth, an actor, and died on the next morning. Lincoln was 6 feet 4 inches in height, with long limbs and large hands and feet, dark complexion, broad, high forehead, deep-set gray eyes, and coarse, black hair. He was slender, wiry and strong, mild and patient, fair and direct in speech and action, scorning all tricks and subterfuges, steadfast in principle, sympathetic and charitable.

In 1911 Congress appropriated \$2,000,000 for a memorial building in Washington (see LINCOLN MEMORIAL); and in 1916 the Lincoln Homestead was made a National Monument (see NATIONAL PARKS). *Bibliography*.—The standard biography is that by Nicolay and Hay, *Abraham Lincoln: A History*, in 10 vols.; the same authors edited the *Complete Works of Abraham Lincoln*. Consult also *Lives* by Morse, Arnold, Stoddard, Curtis, Herndon, and Weik, Lamon, Tarbell, and Beveridge. For an account of his administration, consult Rhode's *History of*

the United States. Recent works include Putnam's *Abraham Lincoln*; McLaughlin's *Washington and Lincoln* (1912); Rothschild's *Lincoln, Master of Men* (1912); Beardslee's *Lincoln's Cardinal Traits* (1914); Carl Sandburg's *Abraham Lincoln: The Prairie Years* (1926).

Lincoln, Benjamin (1733-1810), American soldier, was born in Hingham, Mass. He was a member of the Massachusetts Provincial Congress (1775); and in 1776 was appointed major general of the Massachusetts militia, re-enforcing Washington after the Battle of Long Island. In 1777 he was commissioned major general in the Continental Army. He succeeded Gen. Robert Howe in command of the American troops at Charleston and was forced to surrender to General Leslie (May 12, 1780), he himself being paroled and exchanged in November. He commanded the right wing of the American army at Yorktown, and was delegated by Washington to receive Lord Cornwallis' sword (Oct. 19, 1781). In 1781-4 he was Secretary of War; in 1786-7 commanded the Massachusetts forces engaged in the suppression of Shay's Rebellion; in 1788-9 was lieutenant governor of the State and from 1789 to 1808 was collector of the port of Boston. Consult Bowen's *Life*.

Lincoln, Joseph Crosby (1870-1944), American author, was born in Brewster, Mass. His works, noted as character studies of the natives of Cape Cod, include *Cape Cod Ballads* (1902); *Cap'n Eri* (1904); *Rugged Water* (1924); *Silas Bradford's Boy* (1928); *Back Numbers* (1933).

Lincoln, Robert Todd (1843-1926), American lawyer, eldest child of Abraham Lincoln. From 1881 to 1885 he was Secretary of War in the Cabinets of Presidents Garfield and Arthur, and from 1889 to 1893 was U. S. Minister to Great Britain. In 1897 he became president of the Pullman Car Company, and in 1911 chairman of the board of directors.

Lincoln College. See **Oxford**.

Lincoln College, an educational institution for both sexes at Lincoln, Ill., under Presbyterian control, founded in 1865. In 1901 it became a part of James Milliken University. Lincoln College offers standard college courses in science, ancient and modern languages, and domestic science. In addition, the College has a Preparatory Department and Schools of Pedagogy, Music, and Elocution. For recent statistics see Table under the heading **UNIVERSITY**.

Lincoln Highway. See **Highways, National**.

Lincoln, Hugh of. See **Hugh of Lincoln**.

Lincoln Memorial, a building in Washington, D. C., in honor of Abraham Lincoln. In February, 1911, Congress authorized the expenditure of \$2,000,000 for the erection of a national memorial to commemorate the life and character of Abraham Lincoln; and in January, 1913, approved the plans submitted by the Commission created for that purpose. The work of construction was begun on Lincoln's Birthday, Feb. 12, 1914, the cornerstone was laid on Feb. 12, 1915, and the memorial was dedicated in May, 1922. The Memorial stands at the end of the Mall in Potomac Park, Washington, D. C. As designed by Henry Bacon, of New York, it is a simple and massive Greek temple of marble, erected on a granite rectangular base measuring 168 by 231 ft. There are a central Memorial Hall containing a colossal statue of Lincoln designed by Daniel C. French, and, separated from it by screens of columns, two smaller rooms containing memorials of the Second Inaugural and Gettysburg Addresses. Surrounding the walls of the hall is a colonnade of 36 Doric columns, symbolic of the Union of 1865. Above these are 48 festoons, carved in high relief, representing the States of the Union.

Lincoln Memorial University, a non-sectarian educational institution near Cumberland Gap, Tenn., founded in 1897. Its purpose is to provide opportunities for education to the mountaineers of Kentucky, Virginia, and Tennessee, near the junction of which States the University is situated. There is a medical department, which includes the Lincoln Memorial Hospital and the Nurses Training School at Knoxville. For recent statistics see Table under the heading **UNIVERSITY**.

Lincoln Monument, a monument in Oak Ridge Cemetery, Springfield, Ill., marking the burial place of Abraham Lincoln. On a granite structure, 120 ft. high, stands a bronze statue of Lincoln, designed by Leonard W. Volk. It was erected in 1875, at a cost of more than \$200,000.

Lincoln, Mount (14,297 ft.), a peak of the Rocky Mountains, in Colorado, about 8 m. n.e. of Leadville.

Lincolnshire, maritime co. in the e. of England, between the Humber and the Wash; area, 2,060 sq.m. The chief industries are agricultural and there is some mineral wealth. Cereal form the leading crops;

large numbers of sheep, cattle, and horses are reared; and iron ore, building stone, gypsum, limestone, and brick clay are worked; p. 465,844.

Lincoln's Inn. See **Inns of Court.**

Lind, Johanna Maria (1820-87), known as **JENNY LIND**, famous Swedish singer, was born in Stockholm. In 1841 she went to Paris to receive lessons from Garcia, when Meyerbeer prophesied a brilliant future for 'the Swedish nightingale.' In 1846 she visited Vienna, and in 1847 London, where her success was instantaneous. In 1849-52 she made an extremely successful tour of the United States, during which (1852), in Boston, she was married to Otto Goldschmidt, her pianist.

Lindbergh, Charles Augustus (1902-). American aviator, was born in Detroit, Mich. When Charles was only five years old his father was elected to Congress and for the next ten years he spent a part of his time in Washington. After completing his high school course he entered the University of Wisconsin where he remained two years and in 1921 went to Lincoln, Nebraska where he entered the Lincoln Aircraft School for aviators. In 1924 he joined the army primary training school where he made an excellent record, and some months later entered the Advanced Flying School at Kelly Field, San Antonio, Texas. He was graduated from the Advanced Flying School in February, 1925, and commissioned second lieutenant in the Army Air Corps Reserve. He became a pilot for the air mail service in April, 1925, flying nightly between St. Louis and Chicago. He interested Major Robertson of the Robertson-Aircraft Company, Harry Knight and other business men of St. Louis, who financed the project, had his monoplane the *Spirit of St. Louis* constructed by the Ryan Aircraft Company in San Diego and on May 10, 1927, he flew from San Diego to New York, where on May 20 he set out alone on his famous non-stop flight to Paris, in 33½ hours.

In December, 1927, he started on a series of flights to Mexico and Central and South America. In 1929 he married Anne S. Morrow, daughter of Dwight Morrow and, with her, has made two notable flights. In 1931 they flew from Washington to Japan via the Arctic Circle and in 1933, made a trip visiting 21 countries in four continents, flying 29,081 m. Lindbergh became connected with the Trans-Continental & Western Air Transport and the technical adviser of the Pan-

American Airways. He has been awarded the Congressional Medal of Honor, Distinguished Flying Cross, Royal Air Cross (British), and other tokens of recognition.

On March 1, 1932, his infant son was kidnapped and later found dead after Col. Lindbergh had paid a ransom of \$50,000. The capture, trial, and execution of Bruno R. Hauptmann, made this the most widely known crime of the century.



Charles A. Lindbergh.

The Lindberghs made their home in England from 1934 to 1939 during which time he made a close study of the military and naval airforces in England, France, Germany, Russia, and Italy. He stated that Germany's airforce was the most powerful in the world. In 1939 as a colonel in the U. S. army airforce he toured the major airplane fields and factories of the nation and reported on their condition with recommendations before again retiring to private life. After the 1939 European War broke out he spoke twice urging America to keep out of the war. After U. S. entry into World War II he said, 'We must meet it as united Americans regardless of our attitude in the past.' On April 25, 1941, Pres. Roosevelt classed him as a defeatist, an appeaser, a copperhead. Lindbergh on April 28 tendered his resignation to the President as a Colonel in the U. S. Army Air Corps Reserve, stating that he had no 'honorable alternative' in view of the President's remarks. He became technical adviser at Ford's Willow Run plant.

Linden, Basswood, or Whitewood, a genus of trees (*Tilia*) of the order Tiliaceæ. There are about a dozen species, natives of the temperate zones of America and Europe. The linden is a shapely, somewhat pyrami-

dal tree, with sturdy trunk, and slender, upright, close-growing branches. The wood is white when freshly cut, but becomes brown on seasoning. It is soft, easily worked, and does not warp, and is used for carriage bodies, cabinet work, wooden ware, and paper pulp. In Europe the trees are planted extensively, and are known to the English as 'Limes.'



Linden (Tilia)
1, Flower, section; 2, petal; 3, fruit.

Lindsay, James Bowman (1799-1862), Scottish scientist, was born in Carmylie, Forfarshire. He was a pioneer of wireless telegraphy, and transmitted messages by this means across the Firth of Tay but his accomplishments received little recognition until after his death.

Lindsay, Nicholas Vachel (1879-1931), American poet and lecturer, was born in Springfield, Ill. In 1912 he walked from Illinois to New Mexico, distributing rhymes and lecturing on the Gospel of Beauty. His writings, which are characterized by originality, pictorial beauty, and vitality, include *The Tramp's Excuse, and Other Poems* (1908); *General William Booth Enters into Heaven, and Other Poems* (1913); *The Congo, and Other Poems* (1914); *The Chinese Nightingale, and Other Poems* (1917); *Every Soul is a Circus* (1929); and several volumes of selected poems.

Lindsay, Sir Ronald (1877-1945), British diplomat, who was second secretary of the embassy in Washington (1905-7), first secretary in Paris (1907-8), and then became private secretary to Sir Edward Grey of the Foreign Office. From 1911 to 1919 he

occupied diplomatic positions in The Hague and in Cairo, in 1919 was Charge d'Affairs at Washington and in 1920 Minister Plenipotentiary to Paris. He was Assistant Under Secretary of State in 1921-24, ambassador at Constantinople in 1925-26, at Berlin 1926-28 and in the latter year was made Permanent Under Secretary of State for Foreign Affairs. He was Ambassador to the United States, 1929-39.

Lindsey, Benjamin Barr (1869-1943), American jurist and social reformer, was born in Jackson, Tenn. He founded the juvenile court system and in 1901 was appointed judge of the Denver Juvenile Court, the first court for young offenders ever created. He secured the passage of many reform laws in Colorado, and his system soon acquired an international reputation. In 1908, for political reasons, both the Republican and Democratic parties refused to endorse his candidacy for re-election as juvenile judge, but he was elected by a large majority on an independent ticket and again four years later on a citizens' ticket. Leaving Denver after years of controversy over his advanced social opinions, Lindsey began a new career in California and was elected judge of the Los Angeles County Superior Court (1935). He has lectured widely on juvenile delinquency and is a leader in the fight to abolish child labor. He published *The Colorado Juvenile Court Law, Problems of the Children, The Beast and the Jungle, and The Rule of Plutocracy in Colorado*, is co-author with Edwin Markham and George Creel of *Children in Bondage*, and with Wainwright Evans of *The Revolt of Modern Youth*, and *The Companionate Marriage*.

Linea, or **La Linea**, town, Southern Spain, in the providence of Cadiz, lies between Gibraltar and San Roque, just within the Spanish lines—hence the name. It supplies Gibraltar with vegetables and fruit; p. 62-330.

Lineal. See **Consanguinity**; **Collaterals**.

Linear Measure. See **Weights and Measures**.

Line Engraving. See **Engraving**.

Linen, a fabric spun and woven from flax. The art of spinning and weaving flax into linen is an ancient one. Owing to the wonderful durability of the fibre, many linen mummy cloths of great age and some of extremely fine texture have been found in Egypt. Just before the Christian era the cultivation of flax was extensive in Italy, and it was probably by the Romans that

the growth of flax for textile purposes was introduced into Britain. As early as the 11th century Flanders seems to have acquired some celebrity for the weaving of table-linen. Ireland claims the linen industry long before it was known in England or Scotland. As early as 1200 the linen trade was in a flourishing condition. The real Irish linen trade, as an organized manufacturing movement, dates from 1694, when a group of French Huguenots assembled in Lisburn and established the Linen Manufactory. He brought over a number of Dutch spinners and weavers, together with the latest improvements in spinning wheels, reels, winders, and looms, and expended his fortune on the development of this project.

In 1620 the Mayflower pilgrims brought flaxseed and distaffs to the United States, and up to the middle of the 19th century a large number of American farmers grew a sufficient amount of flax to supply their domestic needs, the spinning and weaving being done by the members of the household. The advent of the cotton gin and the increased manufacture of cottons did away with the need for the home industry, and the growing of flax for linen declined rapidly. The first step in the manufacture of linen, as it has been practiced for centuries, is the recovery of the flax fibre from the flax straw. One method for preparing the flax fibre is known as the Robinson process. After the removal of the seed the flax straw is thoroughly dried by hot air and conveyed to a machine in which the woody shive is broken off. The green fibre, with the gums still in it, is delivered from the machine to a conveying belt and carried to the treatment room, where it is processed and prepared for the softening machine; the entire process, including baling, occupying less than a day.

The next steps in the manufacture of linen are briefly piecing out, roughing and hackling. *Piecing out* consists of dividing the stricks or bundles of fibre into smaller bundles or 'pieces' for convenience in hackling. *Roughing* is the process of roughly straightening and parallelizing the fibres by pulling them through a coarse hackle. The *hackling* proper, or the separation of the fine long fibre, or 'line,' from the shorter coarser fibres, or 'tow,' is done in a hackling machine. The pieces of roughed flax are screwed into clamps or holders, and the fibres are combed out and split up by a succession of hackles attached to endless

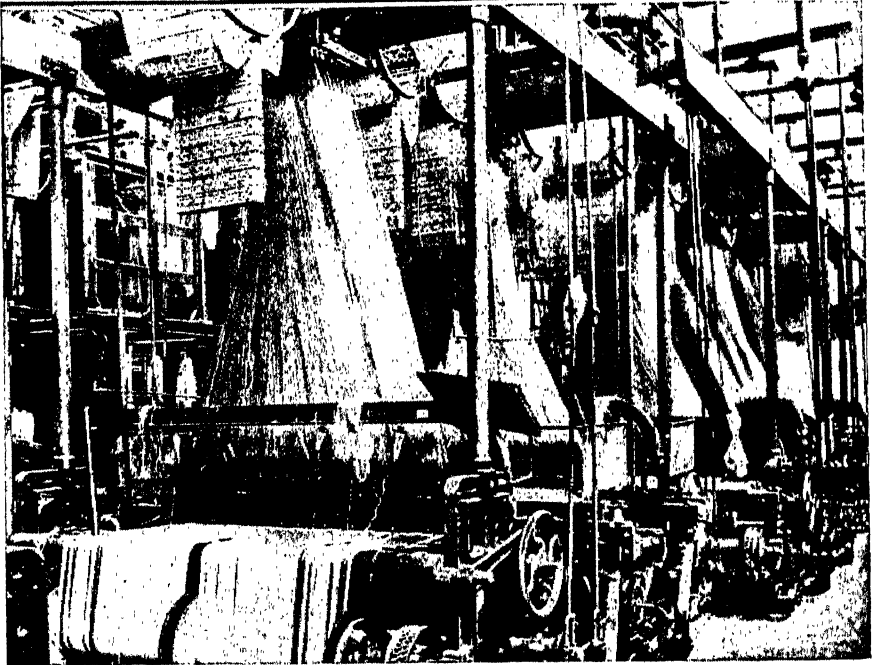
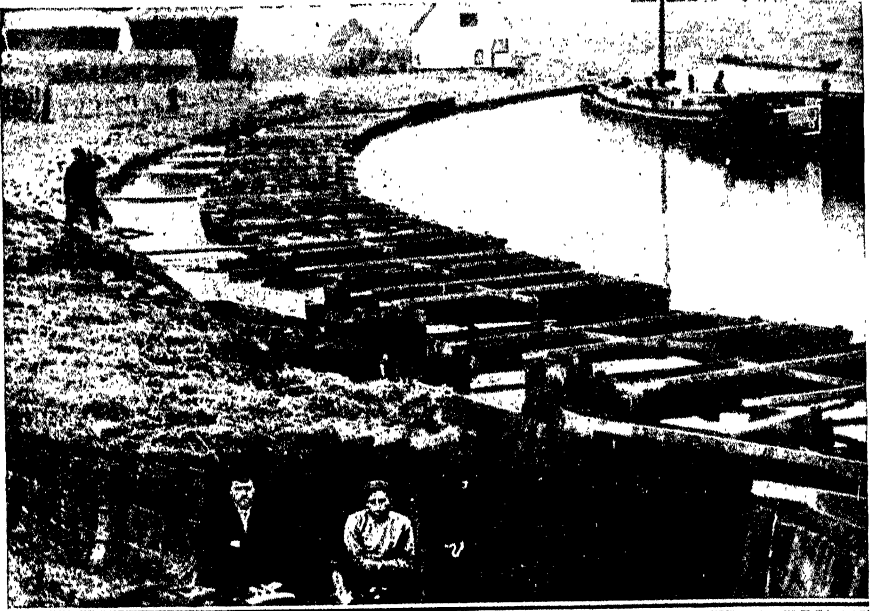
revolving sheets. From the hackling machine the pieces of flax pass to a spread board, where they are formed into an endless ribbon, or sliver. For coarser yarns they go direct from the hackling machine to the board; if a finer product is desired, they are first passed through the hands of sorters. From the spread board the slivers are delivered into cans; these cans, in turn, are placed at the back of a drawing frame; and the slivers are drawn or elongated by being passed through drawing rollers, much after the manner of cotton. The elongated strands are then doubled together into a single sliver, and the operation is repeated several times, the object being to increase the regularity of the sliver, and gradually to draw it out to a degree of fineness more nearly approaching that of the desired yarn. This process is carried still further on the roving frame, which not only continues the drawing out, but gives the sliver a slight twist to strengthen it and winds it on bobbins ready for the actual spinning.

The 'rove' or 'rovings' are now spun into yarn on the 'throstle' machine, or ring spinning frame. In weaving, hand-loomes are still employed for fine linens to some extent, but, generally speaking, the work is done by power-loom. After weaving, linens are variously treated: scoured, dyed, bleached, starched, etc. The uses of linen yarn and textiles are numerous. In addition to its employment in the manufacture of woven fabrics, the yarns find extensive application in lace making and in the manufacture of linen thread and twine. It finds special application in the manufacture of wings for aeroplanes, tents, machine gun belts, fire hose, bandages, shoe threads, and for steam and hydraulic packing. Consult H. R. Carter's *Modern Flax, Hemp, and Jute Spinning and Twisting*; and bulletins of the U. S. Bureau of Foreign and Domestic Commerce.

Lines of Force. See **Magnetism, Condenser, Electrostatic Machines**, and other electrical articles.

Ling, the popular name for the common Scotch heather (*Calluna vulgaris*), a plant belonging to the order Ericaceæ. It is a low-growing, much branched, small evergreen shrub with rose colored, purple, or white fragrant flowers, native to Scotland and naturalized in Maine and Massachusetts and sparingly in Nova Scotia and Newfoundland. It blossoms in August and September.

Ling, Pehr Henrik (1776-1839), Swedish



Photographs by Charlotte Fairchild.

Linen Production.

Upper, Retting grounds on the River Lys, showing the fibre flax in stacks, empty retting crates, and the fibre straw in bundles, ready for retting.
 Lower, Weaving the linen yarn into cloth.

poet and founder of the Swedish system of gymnastics. He learned the art of fencing, and visited Germany, France, and England. He returned to Sweden in 1804, and from 1805 to 1812 was fencing master at the University of Lund. During this time he worked out a theory of scientific gymnastic exercises, which became known all through Europe and America.

Lingayén, pueblo, capital of the province of Pangasinán, Luzón, Philippine Islands, situated on the delta of the Agno River, on Lingayén Gulf; an important trade center and favorite health resort; p. 22,000.

Lingayén, Gulf of, an arm of the China Sea, indenting the western coast of the island of Luzón, Philippine Islands.

n. by the Firth of Forth and on the e., s and w. by Edinburgh, Lanark, and Stirlingshire. The principal rivers are the Almond and the Avon. Coal and oil-bearing shales are largely mined.

Linnæus, Carolus, or Karl von Linné (1707-78), Swedish scientist, founder of modern botany. From childhood he displayed a special interest in plant life and in 1729, while at Upsala, prepared a short treatise on sex in plants, which came into the hands of Olaf Rudbeck, then professor of botany in the university. Linnæus' appointment as adjunctus to the professor followed. In 1732 he made a journey of exploration through Lapland, the botanical results of which were published. He then



Lions.

Lingua Franca, specifically a corrupt form of Italian spoken in commercial intercourse in the Mediterranean region; by extension, any language in general use in conversational intercourse between foreigners and natives over a wide extent of country, as Urdu throughout India.

Linievitch, Nicolai Petrovitch (1834-1908), Russian general, of a well-known Polish Catholic family. He served in the Polish insurrection, the Russo-Turkish War, and the China expedition. After the battle at Mukden (March 7-10, 1905), he was appointed commander-in-chief in succession to Kuropatkin.

Linlithgowshire, or West Lothian, midland county of Scotland, bounded on the

undertook a scientific survey of the province of Dalecarlia, and in 1735 went to Holland.

In Holland Linnæus found helpful patronage in Boerhaave, who introduced him to a wealthy Dutch banker, Clifford, whose magnificent garden and botanical collections Linnæus was engaged to arrange. In a series of studies (1735-1737) he expounded his celebrated system of classification, based on difference in sexual characteristics. The years 1745-1750 were marked by the publication of other studies and reports of journeys in the interest of botany. Linnæus' services to natural science, and especially to botany, were very great, though much of his work was the summing up and systematizing of the results of his predecessors'

labors, as he himself fully acknowledged. To him we owe the binary nomenclature of organisms and an artificial classification of plants.

Linnet (*Linota cannabina*), a small finch belonging to the genus *Linaria*, occurring in the northern regions of both hemispheres. It is about 5 or 6 inches long, with a forked tail; the body plumage is generally brown streaked with white and dark brown, while the wings and tail quills are black with white markings. In the mating season the breast and crown of the male become a bright crimson. Linnets nest in trees and bushes, feeding chiefly on oily seeds. The birds are exceedingly sweet singers.

Linoleum, a floor covering, prepared by coating strong canvas with five or more coats of thick linseed-oil paint, and printing the surface with colored designs. Linoleum consists essentially of a mixture of cork dust and mineral coloring matters, ground with oxidized linseed oil to a stiff homogeneous paste, and put on a canvas backing.

Linotype. See **Typesetting Machines.**

Linseed is the seed of the common flax, *Linum usitatissimum*. The seeds are brown, have an oval shape with sharp edges, and are chiefly valuable for the oil contained in the whitish interior.

Linseed Oil is obtained by crushing and pressing the seeds of the flax ('cold-drawn oil'), a further quantity of an inferior quality being obtained under the action of heat. Linseed oil is largely used both in its raw and boiled state, as a vehicle in which to suspend pigments to make oil paints, and as a component of varnishes.

Linum, a genus of mostly hardy plants, order Linaceæ, with five-merous flowers, blue, yellow, white or flesh-colored. *L. usitatissimum*, the common flax of commerce, is a hardy annual plant, bearing panicles of blue flowers in July. It yields the flax-fiber of commerce, and the flax-seed of medicines. The Rocky Mountain flax is *L. Lewisii*, blue, with linear leaves.

Lin Yutang (1895-), Chinese author and philosopher, who for years has lectured and written in the U. S. Among his books are *My Country and My People* (1936); *The Importance of Living* (1937); *Between Tears and Laughter* (1943).

Lion (*Felis Leo*), the most imposing of the carnivora. Much of the impression of size and strength which the animal gives is due to the flowing mane, present in some,

though not all adult males, and characteristic of the species. Another characteristic is the tuft of long hair at the extremity of the tail, in the middle of which is a curious horny appendage, called the 'thorn.' The color is uniform and tawny, but the young exhibit traces of the stripes so characteristic of most of the cat tribe. As in the other large cats of the Old World, the pupil of the eye is round. An adult male reaches a length of about ten feet (to the end of the tail), while the females are a foot shorter. The mane of the male does not appear till the animal is about three years old. The lion now occurs throughout the continent of Africa, though it has been exterminated in the more civilized regions; in Asia it extends from Mesopotamia and S. Persia to India, but in India only a few remain in the wild hills near Kurrachee.

In habit the animals are mainly nocturnal, usually sleeping during the day in reeds or among bushes. They are sometimes found solitary, sometimes in pairs, or small troops. Mating seems to be for life, and rarely more than two cubs are produced at birth. They breed readily in captivity.

Lion of St. Mark. See **Venice.**

Lions, Gulf of, an arm of the Mediterranean, extending from Cape Creus on the coast of Spain to Hyères Is. on the coast of France. The rivers Rhone, Orb, Aude, and Tet empty into it, and the towns of Marseilles, Cette, and Port Vendres are on its shores. Its name is derived from the raging and roaring of its waves.

Lipari (or **Æolian**) **Islands**, volcanic group in Mediterranean, off n. coast of Sicily and n.w. of Messina, consists of seven large and numerous small islands. The most important is Lipari. Stromboli (3,090 ft.) is constantly active; Vulcano (1,017) is intermittent.

Lippe (sometimes called **Lippe-Detmold**), principality of Germany, n.e. of Westphalia, between the Teutoburger Forest and the Weser R. Area, 469 sq. m.; p. 163,648. The country is well wooded and hilly. Over 50 per cent. of the area is cultivated, mostly in small holdings. Starch, salt, tobacco, bricks, and beer are manufactured. Cap. Detmold.

Lippi, Fra Filippino (1460-1504), painter, son of the following. With some characteristic differences, Filippino's work is in no sense behind that of his father. Among his greatest works are frescoes in the Brancacci chapel at Florence; an altar-piece in Santo Spirito, and another now in the Uffizi Gal-

lery; the *Vision of St. Francis*, in the Badia at Florence; and the *Marriage of St. Catherine*, in San Domenico, Bologna.

Lippi, Fra Filippo—known as 'Fra Lippo Lippi'—(1412-69), celebrated Florentine painter. He became chaplain to the convent of San Giovannino at Florence (1452), and prior of Santa Margherita at Prato (1456). It was here that he met, according to Vasari, the beautiful Lucrezia Buti, afterwards the mother of his son Filippino. One of the greatest painters of his age, Fra Lippo Lippi combined a wealth of coloring and an unerring composition peculiarly his own with a disregard of perspective which was general in his day. Among his great works are the frescoes in the cathedral at Prato, and Madonnas to be seen in several of the great continental collections.

Lippincott, Joshua Ballinger (1813-86), American publisher. He founded the publishing firm of J. B. Lippincott and Co. (1836), which became in 1850 the head of the book trade in Philadelphia. He established a London agency for facilitating the importation of European literature into the U. S.

Lippman, Walter (1889-). American editorial and political writer. He was graduated from Harvard in 1909, and became an editorial writer, first with the *New Republic*, then with the *New York World*. Since Feb. 1931 he has been special writer for the *New York Herald Tribune*, his articles being syndicated for many other newspapers throughout the country. Among his later books are *Men of Destiny* (1927); *A Preface to Morals* (1929); *Method of Freedom* (1934); *U. S. Foreign Policy*; *Shield of the Republic* (1943).

Lipton, Sir Thomas Johnstone (1850-1931), British merchant, was born in Glasgow of Irish parentage. Very successful in retail business, he acquired extensive tea, coffee, and cocoa estates in Ceylon. Sir Thomas Lipton made attempts in 1889, 1901, 1903, 1914, 1920 and 1930 to win the America Cup, an international yachting trophy, from the New York Yachting Club. See AMERICA CUP. He won great popular favor in the United States by his good sportmanship.

Liquefaction of Gases includes those processes of cooling and compression by which gases such as air or carbon dioxide are reduced to the liquid state.

Liqueurs are strongly alcoholic beverages prepared from grain spirit, rectified spirit, or other form of alcohol, flavored with various fruit or herb extracts, usually sweetened and

colored, and sometimes distilled. The more important include absinthe, aniseed cordial benedictine, chartreuse, clove cordial trappistine, curaçoa, kümmel, maraschino, kirschwasser, noyau, crème de menthe, vermouth, sloe gin, and cherry brandy.

Liquid is that state of matter in which the particles can be made to flow over each other by the least assignable force, if sufficient time is allowed, and which also possesses a definite volume—will only occupy a portion of the vessel containing it equal to its own volume—thus differing from a gas, which spreads itself out evenly throughout any volume that may be free to it. These features result in certain characteristic properties of liquids. Thus the free surface—the surface not in contact with, or in the 'immediate neighborhood of, the vessel'—is level and horizontal if the liquid is at rest, the shape and ramifications of the vessel into tubes and the like not affecting the height to which it rises. Another consequence is that the pressure under a liquid is exerted equally in all directions, is also independent of the vessel, and is proportional only to the density of the liquid and to the vertical height from the surface under pressure to the free surface of the liquid.

The phenomena of flotation and its manifold applications also result from the same properties—a body immersed in a liquid experiencing a buoying-up force equal to the weight of liquid it displaces. Liquids, with regard to volume, are perfectly elastic, though under ordinary circumstances highly incompressible: thus water only diminishes one-millionth of its bulk for an increase of one atmosphere pressure—a fact made use of in hydraulic machinery. Besides the properties exhibited by liquids in the mass, there are many important features due to their minute structure, of which those connected with the surface tension, the viscosity, and the phenomena of diffusion and osmosis are the most important. Surface tension is the cause of very many interesting and diverse actions, such as the capillary rise of liquids in fine tubes, the formation of drops and soap bubbles, the meniscus-shaped surface of liquids, the characteristic appearance of jets of liquids, the motion together or apart of scraps of floating matter, and the calming of rough water by oil.

The viscosity of liquids represents the molecular friction, and is the resistance that one part of the liquid exhibits in flowing past another. Viscosity is utilized in lubrication by oils, which form a layer between the rubbing

surfaces, and if sufficiently viscous, with regard to the pressure, to resist being squeezed out, reduces the friction from that obtaining between two solids to the much smaller friction between the liquid particles. The diffusion and osmosis of liquids, or power that a particle of a liquid has of transferring itself from one point to another in the liquid, even against gravity or the rough membranes, are closely allied effects, explainable on the theory that the molecules of a liquid, like those of a gas, are in motion, though of a more restricted character. On this account the diffusion of liquids is very much slower than that of gases, but differ for different substances in a somewhat similar manner. The phe-

brought into a liquid condition by the combined effect of lowering its temperature and expanding it from a sufficiently high pressure. Liquid air is a non-conductor of electricity. Its density varies with its age and according to its oxygen content. Properly protected from external heat and subjected to high exhaustion, liquid air becomes a transparent, jelly-like mass. By means of liquid hydrogen it may be solidified into a white solid with a faint blue tint. Liquid hydrogen is the lightest liquid known, its density being only 0.07. It boils at -252.7° C. Nitrogen forms a colorless liquid at -195° C. when its density is 0.80. Evaporated under diminished pressure the liquid solidifies at a temperature of



A Painting by Fra Filippo Lippi—'The Annunciation.'

nomena of the change of liquids to solid, and liquid to gas, and conversely, are described in the articles on FREEZING, EVAPORATION, and GASES.

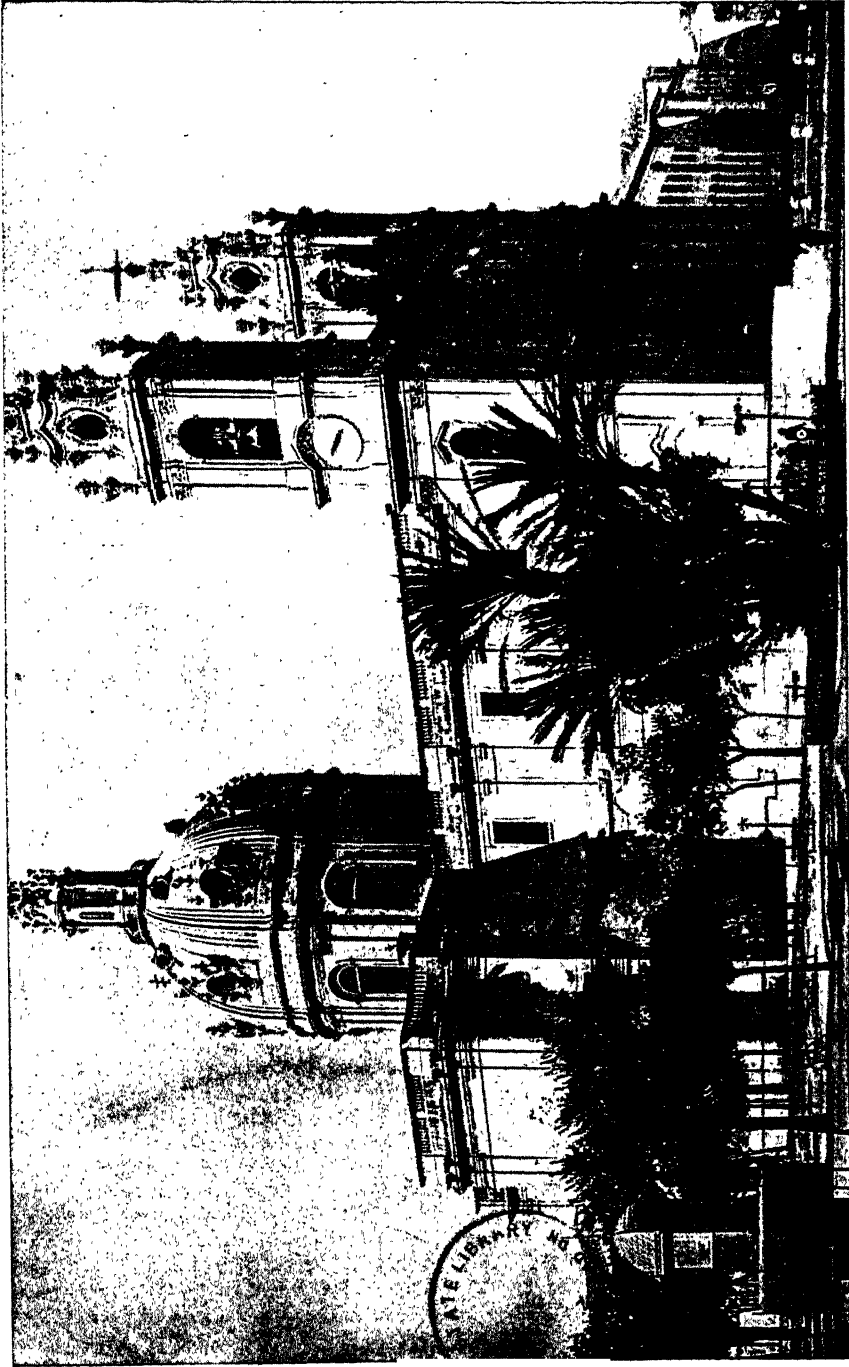
Liquidambar (also called **Alligator Tree**), a genus of trees belonging to the family Hamamelidaceæ. *L. styraciflua*, the American Sweet Gum tree, is a beautiful tree with palmate leaves, a native of Mexico and the United States. Its wood is of a hard texture and fine grain, and is used for furniture, shingles, paving blocks, spools, and fruit boxes.

Liquidation in a general sense means the determination of the amount or value of debts, property, and the like. In a special sense it denotes the winding up of a business or other mercantile concern, usually on account of insolvency.

Liquid Gases. Air, like all gases, may be

-209.8° C. Liquid oxygen has a faint blue color, and boils at -182.9° C., at which temperature it has a density of 1.14. It is a non-conductor of electricity, and strongly magnetic. It can be solidified to a pale-blue liquid by exposure to the temperature of liquid hydrogen.

Helium, which long resisted the efforts of all physicists to liquefy it, was at length liquefied by Onnes at Leyden, Holland, in 1908. The only technical use of helium is as a supporting medium for lighter-than-air dirigible balloons, where it is especially desirable because of its non-flammability and low density. Only the United States has a commercial supply. Ozone, when liquefied by the use of liquid air, is a blue liquid which boils and explodes at -120° C. As refrigerators and as sources of motive power, the liquid gases named above are not economical because of



Cathedral in Lisbon.

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their relatively small latent heats. See GASES.

Lira (plural *lire*), an Italian silver coin, is divided into 100 centesimi.

Lisbon, capital of Portugal and of the province of Estremadura. The city is beautifully situated on the n. bank of the River Tagus, 12 miles from its mouth, in a narrow valley flanked by hills. It is built on a series of terraces, with the mountains of Cintra in the background, and is exceptionally beautiful when viewed from the river. In front the harbor widens out into an extensive, almost landlocked bay, capable of sheltering the largest vessels. In the valley, on the river bank, are the Custom House, arsenals, and ship yards. The highest point on the e. side of the valley is crowned by the ancient and now obsolete fortress of St. George. On a slightly lower point is the Cathedral, containing the tomb of St. Vincent, the city's patron saint. This section, known as the *Alfama* or 'old town,' suffered comparatively little in the great earthquake of 1755, and with its steep and winding alleys has a mediaeval aspect quite in contrast with the rest of the city. The climate in spring and autumn is charming, the winter months damp and mild, and the summer oppressively hot. There is an excellent water supply brought to the city by two huge aqueducts, one dating from the eighteenth century. The chief imports of Lisbon are grain, sugar, cotton, coal, petroleum, and timber; the exports, cork, copper, wine, cotton, wheat, olive oil, salt, fruits and vegetables, and fish. Of the exports, wine and cork are the most valuable. The city has an important over-sea trade, including the re-exportation of cocoa and rubber; p. 594,390.

History.—The history of Lisbon is practically that of Portugal. Thus, the city submitted successively to the domination of Romans, Huns, Visigoths, and Moors. The latter were expelled by Alphonso I. of Portugal in 1147, and the city remained in the hands of the Portuguese until 1580. It was under Spanish government from 1580 to 1640, when the Duke of Braganza captured it and restored the independence of Portugal. Great destruction was caused by the earthquake of 1755, which in conjunction with a tidal wave caused the death of between 30,000 and 40,000 people, and the loss of property valued at \$100,000,000. In 1908 Lisbon was the scene of the assassination of King Carlos and Crown Prince Luiz. Two years later King Manoel was exiled and a republic established. When the constitution of Portugal, adopted in 1911, was superseded in

April, 1933, the former Premier, Gen. Vicente Treitas, was removed from his post as president of the Municipal Chamber of Lisbon because he had criticized the proposed constitution. For later history, see PORTUGAL.

Lissa, island belonging to Dalmatia, in the Adriatic Sea, off the Dalmatian coast. It has a good harbor at its chief town, Lissa; p. 6,000. Here was fought (1866) the first action between squadrons of ironclads, when the Austrian fleet defeated the Italian fleet. Lissa was occupied by the Italians immediately after the World War but was ceded to Yugoslavia in 1920 by the Treaty of Rapallo; p. 10,000.

Listemann, Bernard (1841-1917), American musician, was born in Schlotheim, Thuringia, Germany. He went to the United States (1867). He was concert master of the Theodore Thomas Orchestra, New York (1870-4), founded (1874) the Boston Philharmonic Club, and organized (1879) the Boston Philharmonic Orchestra, of which he was director. In 1881 he was concert master of the Boston Symphony Orchestra, and in the same year founded the Listemann String Quartette.

Lister, Joseph, First Baron (1827-1912), English surgeon. After several years in Edinburgh, he was appointed to the chair of surgery in Glasgow University (1860); to that of clinical surgery in Edinburgh University (1869); and to Kings College, London (1877), from which he retired in 1893. By 1850 the use of anæsthetics had made deliberate and complicated operations possible; but even in those cases in which the results were most brilliant from a surgical point of view, death from wound infection was a common termination. Influenced by Pasteur's discoveries of the origin of fermentation and putrefaction, Lister began his far-reaching and important work on the cause and prevention of septic infection of wounds, which speedily led to the employment of antiseptics in all surgical operations. For his discoveries and scientific attainments Lord Lister received many honors.

Liszt, Franz (1811-86), Hungarian pianist and composer. At the age of nine he began to play in public. He was taken to Vienna, where he studied under Czerny and Saleri, and subsequently proceeded to Paris. In 1831 he heard Paganini, and was fired by the resolve, which he carried to triumphant issue, to become the Paganini of the pianoforte. In 1849, at the height of his popularity, he retired to Weimar to direct the opera and concerts, and to devote his time largely to com-

position and teaching. Here commenced the close relationship with and incalculable services rendered to Wagner. Listz's name as a composer is somewhat overshadowed by his fame as a pianist. He was the creator of the symphonic poem, a new orchestral form. His *Hungarian Rhapsodies* for the piano are still unrivalled.

Litany ('a supplication'), a term denoting a solemn form of public supplication, specifically applied to an appointed form of responsive prayer used as part of a service or separately.

Litchi, or **Lee-Chee** (*Nephelium litchi*), a tropical evergreen tree belonging to the natural order Sapindaceæ. It is grown extensively in Southern Asia, and its fruit is considered exceedingly delicious. The fruit is the size of a small walnut. The Chinese preserve the fruit by drying, and in this state it is extensively exported.

Litharge, lead monoxide (PbO), occurs native as lead ochre, but is chiefly obtained by the oxidation of lead in the process of cupellation. Litharge is used as a component of flint glass, to glaze earthenware, and in the preparation of the compounds of lead.

Lithium (Li, 6.94), an element of the alkali-metal group. It is widely distributed in combination, occurring in many minerals, waters, and soils—the chief source being the silicates, which are found as the minerals lepidolite and spodumene. Spodumene comes largely from South Dakota, while lepidolite is found in California. Lithium is obtained by the electrolysis of its fused chloride, and is a soft white metal (m. p. -186° c.), the lightest solid known (sp. gr. .59).

Lithopone, a mixture of zinc sulphide with barium sulphate, manufactured as a white paint and enamel, and is employed in the rubber and paper-making industries.

Lithospermum, a genus of hardy herbaceous plants, of the order Boraginaceæ. *L. canescens* is the Puccoon, a dye plant used by the American Indians.

Lithotomy and **Lithotrixy**, technical names for the methods of removing calculus or stone from the bladder.

Lithuania, a former republic of Europe, formed in 1918 after the break-up of the Russian Empire, with an area of 20,500 sq. miles. Its capital, Vilna, was assigned by the Council of Ambassadors to Poland in 1923, and its temporary capital became Kaunas, or Kovno. Its population was about 2,011,173 before its partition by Germany and Russia in 1939, and its occupation by German forces

in the summer of 1941. About one-half of Lithuania's total area is arable land, a fourth meadow and pasture land, 16 per cent. forests, and 9 per cent. unproductive lands; more than three-fourths the population are engaged in agriculture, the principal crops being wheat, rye, barley, oats, potatoes, peas, and flax. The principal exports are corn, cattle, eggs, butter, flax, timber, hides and wool. Roman Catholics constitute nearly three-fourths of the population. The Lithuanian language has marked affinities with Slavonic, though it cannot be considered a Slav tongue. It is the most archaic of all living Aryan languages. The constitution was adopted on Aug. 1, 1922, and amended May 15, 1928. The legislative body is the Diet, or *Seimas*, elected every five years by universal suffrage. The people elect a President for seven years.

In the partitions of Poland (1772, 1793 and 1795) Greater Lithuania fell to Russia and Lithuania Minor to Prussia. In 1849 a Russian ukase forbade the official use of the name Lithuania, substituting for it 'North-western Country,' the Lithuanian language and books were forbidden, and the Lithuanian schools were closed. The country was occupied by the Germans during the World War. In September 1917, a Lithuanian Conference of 240 representatives met at Vilna, elected a Lithuanian State Council and demanded the complete independence of Lithuania. This independence was proclaimed February 16, 1918.

The territory of Memel (943 sq. miles), taken from Germany under the Versailles Treaty, was seized by Lithuanian irregulars in 1923. Concerned by the growth of the Nazi movement in Memel, which had 75,000 Germans desirous of reuniting with Germany, the government in 1933 broke off the agreement with the German Protestant Church on the ground that it had ceased to exist officially when Hitler took over control.

In 1939, Hitler wrested Memel from Lithuania. Thus Lithuania lost 152,000 of her population and her best seaport. Oct. 1939 Russia forced Lithuania to permit the erection of Soviet fortifications and the quartering of Red Army troops within her nation. In return Russia ceded Wilno, a part of Poland which the Soviet had seized. In 1940 Lithuania became a province of Russia. In 1941 the Nazis occupied Lithuania.

Litmus, a well-known coloring matter, which is obtained from several lichens, but chiefly from *Leccanora tartarea*. Litmus is

turned red by acids and blue by alkalis, and is used as an indicator in acidimetry.

Litre, a metric measure of capacity, both dry and liquid. It is the volume of a cubic decimeter, and contains a kilogram of water at 39.2° F. (4° C.) in a vacuum; it is equal to 0.26 gallon, and is therefore greater than a quart—3.78 litres being roughly equal to a gallon. Ten litres make a decalitre; 100, a hectolitre; 1,000, a kilolitre.

Littell, Eliakim (1797-1870), American publisher. He established in Philadelphia in 1819 a literary paper which he maintained with great success till 1844, under the titles of *The National Recorder*, *The Saturday Magazine* and *The Museum of Foreign Literature and Science*. Removing to Boston, Mass., he inaugurated *Littell's Living Age*, still published, now in New York.

Little Bear, the constellation Ursa Minor.

Little Colorado River rises in New Mexico, and flows northwest through Arizona until after a course of about 240 miles it enters the Colorado River, of which it forms an important affluent, at the Grand Canyon of the Colorado. Most of its course is over a desert plateau.

Little Entente, The, an alliance of small central European countries, which flourished after the Great War. It included Yugoslavia, Rumania and Czechoslovakia, and was formed with the moral support of France, then the dominant continental military power. The principal object of the Little Entente was mutual support to retain territory which the war victors had compelled Germany, Austria, Hungary and Bulgaria to cede to its members. When re-armed Germany in 1938 proceeded to grab portions of Czechoslovakia and to encourage Hungary and Poland to do likewise, the hollowness of the Little Entente became apparent, and the Little Entente failed to show resistance when Hitler seized Czechoslovakia, in 1939.

Little Falls, city, Minnesota, co. seat of Morrison co. on the Mississippi River. It is the birthplace and childhood home of Charles A. Lindbergh; p. 6047.

Little Falls, manufacturing city, New York, Herkimer co., on the Mohawk River and the Erie Canal. It was settled by Germans in 1782, and chartered as a city in 1895; p. 10,163.

Little Kanawha River, rises in West Virginia, and after a northwesterly course of about 100 miles, 40 of which are navigable, enters the Ohio River at Parkersburg. It flows through an extensive lumber district.

Little Rock, capital and largest city of Arkansas, county seat of Pulaski co., on the s. bk. of the Arkansas River. The city, covering an area of 17.75 sq. miles, stands on a high bluff, commanding the foot hills of the Ozark Mountains, and the Arkansas River, here crossed by three railroad bridges and two steel and concrete highway bridges. It has fine State and civic buildings, including the State Capitol and various State institutions of an educational and charitable nature, a U. S. District Court, U. S. Land Office, a Federal Reserve Bank, City Hall, and Public Library, and important educational institutions. Among its institutions are the State Hospital for Nervous Diseases, and the U. S. Veterans Hospital. Little Rock is an important manufacturing, banking, cotton-marketing and wholesale and retail trade center. It has manufactures of lumber, cottonseed products, shirts, overalls, tents, awnings, and fertilizer, and crushed stone, sand and gravel plants. Near by are mines of coal, bauxite, and manganese, oil and gas wells, and clay, sand and gravel pits. It is a region of diversified farms; p. 88,039.

Little Russia, a district in the s.w. part of Russia, comprising the governments of Tchernigov, Kiev, Poltava, and Kharkov, now included in the Ukraine republic; p. 14,400,000.

Little Sioux River, Iowa, flows southwest to the Missouri. Length, about 300 miles.

'Little Steel' Formula (July, 1942) was developed by the WLB when the United Steel Workers of America (CIO) demanded a dollar-a-day raise for workers. It set a ceiling of 15 per cent. above the average straight-time rates that prevailed Jan. 1, 1941.

Littoral Deposits consist of the coarser land debris accumulated in shallow water around the edges of the oceans and seas.

Liturgy ('public service'). The term liturgy, though used loosely of the entire prayer-book, is more properly applicable to the Office for the Celebration of the Holy Communion. In ancient liturgies the service was divided into two parts. The first was open to those under instruction who had not yet been baptized; the baptized alone were admitted to the second part.

Litvinoff, Maxim (1876-), Soviet statesman, who came to the United States as his country's representative for the conferences with President Roosevelt in November, 1933, preliminary to the recognition of Soviet Russia by the United States. As Commissar of Foreign Affairs, he represented his government abroad. He resigned 1939, was made

ambassador to the U. S. 1941, and recalled to Russia in Aug., 1943.

Liver. The liver is the largest gland in the body, weighing nearly four pounds, and measuring about eleven inches in transverse diameter. Its upper surface is convex, and lies in contact with the diaphragm above; while its lower surface is concave, arching over and touching the stomach, intestines, and right kidney. In shape the liver is irregular, being

one of the anterior fissures lies the gall-bladder, a pear-shaped membranous sac about four inches in length and one inch in breadth at its widest part. The blood supply of the liver is complicated.

Amongst the functions of the liver are the elaboration and the storing up of certain products of digestion which are brought to it by the portal vein. This large venous trunk is built up by the union of the intestinal

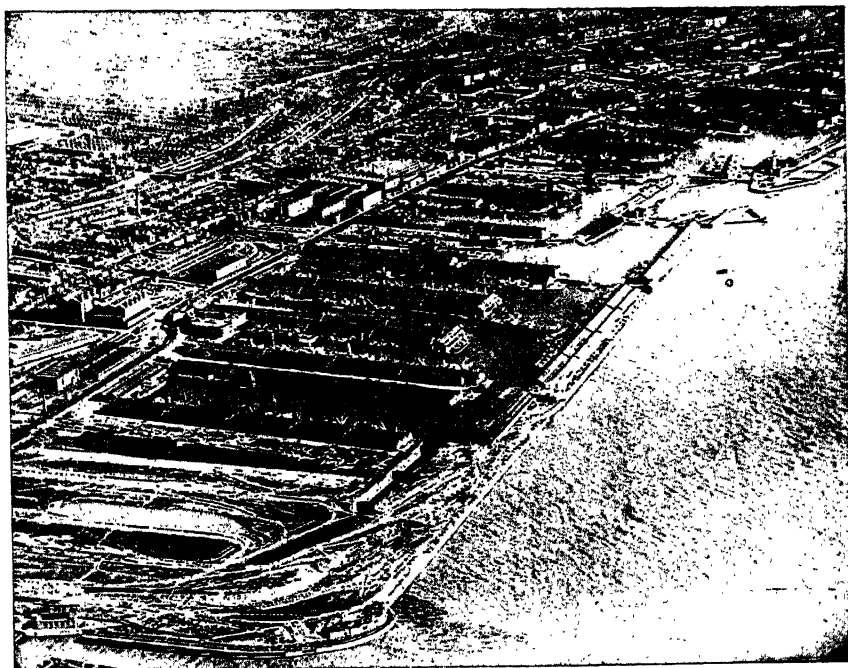


Photo from Brown Bros., N. Y.

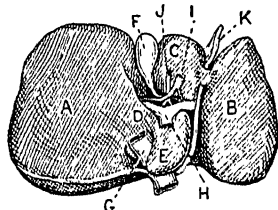
The Docks at Liverpool.

Liverpool has 65 docks, with a water area of 600 acres, and 22 graving docks.

thickest from above downwards upon the right side, and extending in wedge fashion towards the left. It is also thicker posteriorly and presents in front a thin edge which is marked by a deep notch. The right lower border corresponds with the margin of the ribs, but its position varies to some extent with the movements of the diaphragm, to which the liver is attached by ligaments, formed by folds of the peritoneal covering, which also dips into the fissures. Five fissures on the under surface of the organ divide it into a corresponding number of lobes, and in

veins which contain blood charged with food extractives, and reaching the liver it ramifies like an artery within the substance of that organ. Until comparatively recent years the chief function of the liver was supposed to be the production of bile. Bile is now regarded more as an excretion than a secretion, being a by-product formed by the liver cells in the course of manufacture of more important compounds. Receiving as it does the blood from the alimentary canal, the liver subjects the food to a second digestion, and while transmitting through the hepatic veins

to the general circulation whatever is required for immediate use, it retains and stores up any surplus, which it subsequently doles out to the tissues as required. The substance which is thus manufactured and passed on to the blood is a sugar called glucose, and the excess is stored up in the liver cells in the form of glycogen. One more function of the liver is the regulation of the number of red blood corpuscles.



Under Surface of Liver.

A, Right lobe; B, left lobe; C, quadrate lobe; D, caudate lobe; E, Spigelian lobe; F, gall-bladder; G, inferior vena cava; H, portal vein; I, hepatic artery; J, hepatic duct; K, umbilical vein.

Liver Fluke (*Distomum hepaticum*), a destructive parasite of the sheep, in which it gives rise to the disease known as sheep rot or liver rot.

Livemore, Mary Ashton (Rice) (1821-1905), American reformer. She performed important services in connection with the Sanitary Commission in the Civil War. Afterward she took an active interest in the Woman's Suffrage movement, was editor of woman suffrage papers and became widely known as a lecturer on this subject and on temperance. She was for many years president of the Women's Christian Temperance Union.

Liverpool, city and episcopal see, England, in Lancashire, on the eastern bank of the Mersey River. It is the first port of England in respect of total trade. It has an area of 33 sq. m. and a river frontage of over 8 m. Large expenditures have been made for civic improvements, and in the demolition of unsanitary living quarters and the rebuilding into wholesome and sanitary homes for workingmen, Liverpool has been a pioneer. Docks and warehouses line both sides of the river; there are 87 docks and basins and 22 dry-docks. The landing stage, one of the greatest floating structures in the world, with a

deck nearly 2,500 ft. long, is in the center and enables the largest transatlantic liners to dock regardless of the tide.

Municipal ownership includes public baths and workmen's dwellings. An aqueduct 68 m. long built at a cost of \$10,000,000 brings the water supply from Lake Vyrnwy. The principal building in Liverpool is St. George's Hall, one of the finest buildings of the classical Renaissance. It is used for public assemblies and musical events. The municipal offices occupy imposing structures in the Palladian style. The leading educational institution is the University of Liverpool, formerly a constituent college in the Victoria University, Manchester, incorporated by royal charter on July 15, 1903. The cathedral in course of erection on St. James Mount, when completed, will excel all British cathedrals in point of size. The corner stone was laid in 1904, the Lady Chapel was completed in 1910, and the first portion was consecrated in 1924. It is a 14th century Gothic structure, with a beautiful but simple and dignified interior.

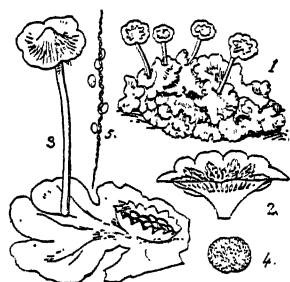
Although primarily a commercial port, Liverpool has also thriving and important industrial interests, notable among which are iron and steel works, sugar refineries, grain mills, tobacco factories, shipyards, and manufactures of chemicals and toys.

The port of Liverpool is one of the greatest trading centers of the world, and the great area of docks and warehouses is equipped with all the latest and the finest apparatus. Chief among the imports are cotton, wheat, beef, tobacco, and sugar. The chief exports are cotton, machinery, woollens, and iron and steel manufactures. Liverpool has grown from a comparatively small town of 75,000 in 1800, to a modern city of more than 855,000. Our first knowledge of the town dates from the Irish wars of Henry II. In 1229 Henry III. granted the town a charter of incorporation, and in it gave powers for the formation of a trades guild. The growth of Liverpool and the development of its commerce began about 1800, and has continued steadily until the present time.

Liverpool Plains, a level tract of pastoral country, ten million acres in extent, in the northeastern part of New South Wales, Australia. The Darling River divides it from the Warrego district. The chief town is Tamworth.

Liverworts, the popular name given to the class of flowerless plants known as Hepaticæ, from the shape of the vegetative parts. They are mostly dwarf plants with the prostrate 'thallus' closely attached to the surface of

damp rocks or wood; but some species are of larger and more erect growth. There are three groups of liverworts known as the Marchantiales, the Gungermanniales, and the Anthocerotales, the last comprising those forms which have given rise to the mosses.



Liverworts.

1. *Marchantia polymorpha*. 2. Receptacle (section). 3. Frond with cupule containing bulbils.
4. Bulbil. 5. Adult elater and spores.

Livery, an abbreviation of the word 'delivery,' signifying the gown, coat, or hood given by a sovereign or nobleman to his followers or retainers. In modern phrase 'livery' is applied exclusively to the dress or uniform of servants and dependents.

Livingston, seaport, Guatemala, in the department of Izabal, at the mouth of the Rio Dulce. Steamers ply from the town up the river to Izabal (45 m.), the trip being famous for its scenic beauty. Livingston is the seat of a United States consul; p. 1,978.

Livingston, city, Montana, co. seat of Park county on the Yellowstone River and the Northern Pacific Railroad; known as the gateway to the Yellowstone (National) Park. Its coal, coke, and gold-mining interests are noteworthy; p. 6,642.

Livingston, Edward (1764-1836), American jurist and statesman, younger brother of R. R. Livingston, was born in Clermont, N. Y. He became one of the leaders of the N. Y. bar. From 1795 to 1801 he was a Democratic-Republican representative in Congress, and from 1801 to 1803 was both mayor of New York City and U. S. district attorney for New York State. He was Secretary of State in the cabinet of President Jackson (1831-3), and was U. S. minister to France (1833-5).

Livingston, Peter Van Brugh (1710-92), American merchant, was born in Albany, N. Y., second son of Philip, second Lord of Liv-

ingston Manor, and Catherine (Van Brugh) Livingston. He was graduated from Yale (1731), and soon became a successful merchant. In 1746 he was an original trustee of the College of New Jersey, at Elizabethtown, which afterward became Princeton College. He was identified with pre-Revolutionary movements; president of the 1st Congress and State treasurer. He was treasurer of the Continental Congress (1776-78).

Livingston, Robert (1654-1725), the founder of the famous Livingston family in America, born at Ancrum, Scotland. He emigrated to America about 1673, settled in Albany, N. Y., in 1675, and in 1679 married Alida, the sister of Peter Schuyler. In 1675 he was appointed by Governor Andros as secretary of the Board of Indian Commissioners. In 1686, the first grants were made to him, which resulted in the establishment, in what later became Dutchess and Columbia counties, of 'Livingston Manor,' one of the principal manorial estates in colonial New York. Livingston was a member of the N. Y. Assembly (1711-25).

Livingston, Robert R. (1746-1813), American jurist and statesman, elder brother of Edward Livingston, was born in New York City. He was for a short time a partner of John Jay, with whom, on the approach of the Revolution, he was associated in opposition to the arbitrary measures of the British government. He was a delegate to the Continental Congress (1775-7 and 1779-81), serving on the committee which drafted the Declaration of Independence; was a member of the committee which drafted and of the convention which adopted the first state Constitution of New York, and was chancellor of the State of New York (1777-1801), in this capacity administering the oath of office to President Washington in 1789. From 1781 to 1783 he was the first secretary of foreign affairs under the Confederation Government, and in 1788 he was a member of the State convention which ratified for New York the Federal Constitution. As minister to France (1801-4) he took the principal part in negotiating the purchase of Louisiana, in which he was associated with James Monroe. He subsequently cooperated with Robert Fulton in rendering steam navigation practicable.

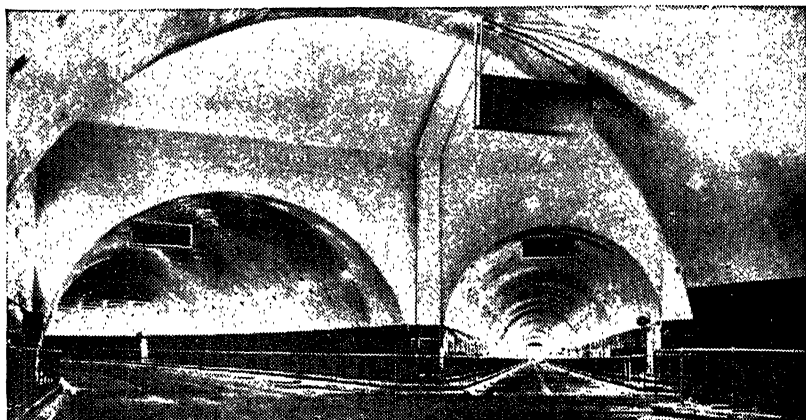
Livingstone, or Kings' Mountains, a range of highlands in Tanganyika Territory, Africa, girdling Lake Nyasa on the n. and n.e.

Livingstone, David (1813-73), Scotch missionary and African explorer, was born in Blantyre in Scotland. From the age of ten he

worked in a cotton factory. In 1840 received the diploma of the Glasgow Faculty of Physicians and Surgeons. In the same year he was ordained a missionary by the London Missionary Society, and set sail for the Cape. Settling in Bechuanaland, he married in 1844 Mary, daughter of Robert Moffat.

the Kasai, and reached the coast at Loanda. Retracing his steps to Seshoke, he passed down the river, discovering the Victoria Falls, and came to Quilimane in May, 1856.

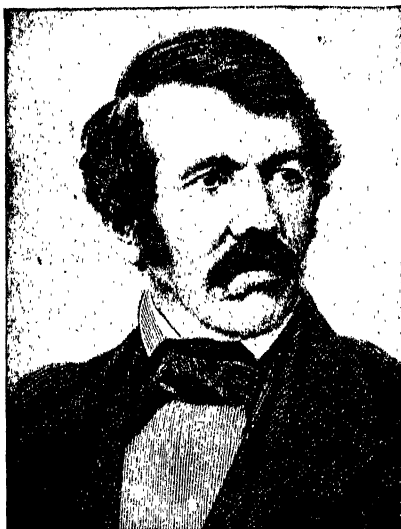
After a visit to England, where various honors were conferred upon him, Livingstone returned to the Zambezi. From 1858 to 1864



Mersey Tunnel, Liverpool, England.

In 1849 Livingstone began his explorations by a journey to Lake Ngami, which he discovered and surveyed, and the Zambezi River,

he, with Dr. (afterwards Sir John) Kirk, explored the Zambezi, Shire, and Rovuma rivers, and discovered Lake Nyasa (1859). His great object now was to discover the ultimate sources of the Nile. In April, 1866, he was landed at Mikindani, whence he marched by the Rovuma River and the southern extremity of Lake Nyasa, and across the Loangwa and Chambezi rivers to the southern end of Lake Tanganyika. In October, 1871, he was, when in great straits, relieved by Stanley, who had been sent out by the *New York Herald* to find him. Stanley returned to the coast, taking with him Livingstone's journals, while the wornout traveler marched southwards in 1872, and skirting the southeastern shore of Tanganyika struggled on in a dying state till he reached Chitambo's village, s. of Lake Bangweolo, where he expired in May, 1873. His body was carried by his faithful followers to the coast, and was buried in Westminster Abbey in April, 1874. During his three long journeys Livingstone opened up vast tracts to missionary enterprise and colonization, discovered the lakes Ngami, Nyasa, Shirwa, Bangweolo, and Mweru, and the Lualaba River, the upper course of the Congo, and was the first European to traverse the whole length of Lake Tanganyika. The narrative of his early explorations was given in his *Missionary Travels*



David Livingstone.

accompanied by Oswell and Murray. Again, in 1852, he reached the Zambezi at Seshoke, ascended the river, crossed the watershed to

in *South Africa* (1857); of his second journey, in *The Zambezi and its Tributaries* (1865). Consult also Stanley's *How I Found Livingstone*; Hume's *David Livingstone*.

Livius, Titus, known as **Livy** (59 B.C.-17 A.D.), the famous historian of Rome, spent most of his life at Rome. The real and only work of his life seems to have been his *History of Rome*, which contained the history of the Roman state, from the foundation of the city (753 B.C.) to the death of Drusus (9 B.C.), consisting of 142 books, of which only 35 are extant. As a historian, Livy has always enjoyed a high reputation; and as far as merely literary excellence goes, he is perhaps unsurpassed among the historians of the world. His great defect is that he was at no pains to consult original authorities, but depended on family legends, or the accounts of previous historians. Yet his genius as a story-teller has made his work immortal.

Livonia, a former government of n.w. Russia, one of the three 'Baltic Provinces'; divided at the close of the Great War between the newly formed republics of Esthonia and Latvia. It has an area of 18,158 sq. m. and a population of about 1,800,000. The surface is generally flat, marshy, or sandy, feebly sprinkled with thin forest or brushwood, enjoying nowhere special fertility; but on the former Esthonian frontier is a considerable plateau region. The chief forests lie between the Pernava and the Aa; pines, firs, birches, alders and oaks are the more common trees. The leading crops are rye, barley, and flax; wheat, oats, and hops are of less importance. Fisheries are important and are the chief source of local food. The district is important industrially, the chief industries being distilling and sugar refining; tobacco, wool, cotton, and linen manufactures are also important. Commerce is considerable, especially through the ports of Riga, Pernava (Pernau), and Arensburg. The population includes Russians, Letts, Esthonians, Germans, and Poles. In 1621 Livonia became Swedish, and was recognized as such by the treaty of Oliva (1660). Peter the Great won it from Sweden early in the 18th century, and the province was recognized as Russian by the treaty of Nystad (1721). It was reorganized by Catherine II. (1783) as the 'Government of Riga,' but its old name and organization were restored by Paul. In the 19th century severe measures were taken for the Russification of Livonia; the Russian code was introduced (1835); Russian was made the official language, and the university of Dorpat was thoroughly Russianized. At the

close of the Great War the greater part of Livonia was incorporated in the new republic of Latvia. The rest went to Esthonia.

Livorno. See **Leghorn**.

Livre, an old French coin, superseded by the franc in 1795.

Lizard Head, or **Lizard Point**, a promontory with a dangerous reef, on the s. coast of Cornwall, England, 16 m. s.w. of Falmouth. It is the most southerly point of Great Britain, and has two lighthouses. The name is also applied to the whole peninsula, of which this is the southern point.

Lizards, reptiles belonging to the order Lacertilia, which is included in the sub-class known as Sauria, which contains both lizards and snakes (Ophidia). Lizards are widely distributed over the globe, especially in the warmer regions, and are numerically the most abundant of all reptiles. The great majority of them are land animals. They are generally extremely agile.

In classifying lizards, Gadow recognizes three sub-orders—(1) Geckones, including the curious little geckos; (2) Lacertæ, including all the typical forms; and (3) Chamæleontes, the aberrant chameleons. The most familiar forms of lizard belong to the genus *Lacerta*, which includes the numerous small swift species common in the arid regions of the South-western United States. In all these two pairs of well-developed limbs are present, each furnished with five-clawed digits. See **GECKO**, **CHAMELEON**, **MONITOR**, **IGUANA**. Consult Dittmar's *The Reptile Book*; and publications of the U. S. Biological Survey.

Llama (*Auchenia lama*), a most useful South American ruminant of the camel family. As a beast of burden the llama was in general use at the time of the Spanish conquest, and its sure-footedness and power of foraging for itself made it most valuable for transport in the rough and steep mining regions of the Andes. In many places, however, mules have replaced the llamas.

Llandudno, seaside town and summer resort, Carnarvonshire, Wales.

Llanes, seaport, province Oviedo, Spain, on the north coast; a celebrated bathing resort.

Llano Estacado, extensive plateau, partly in Texas and partly in New Mexico, separated from the Rocky Mountains in the west by the valley of the Pecos, and extending east to form that source of the head waters of the Red, Brazos, and Colorado.

Llanos, Spanish name for the vast plains of the Orinoco basin, South America. In some

parts they are barren and sandy, in others covered with luxuriant grass and stocked with vast herds. In the rainy season the lower portions are more or less submerged, and in the dry season the higher portions become parched.

Llanquihue, province, Southern Chile, between the Andes and the Pacific Ocean on the w., Valdivia province on the n., and Argentina on the e. Agriculture is the chief employment, and timber is exported. Chief town, Puerto Montt. Area 35,390 sq. m.; p. 137,000.

Llanquihue Lake, largest lake of Chile, in Llanquihue province. Area, 225 sq. m.

Llewelyn the Great (d. 1240), Prince of North Wales, succeeded his uncle, whose territory he usurped (1194). King John helped him to annex South Wales, and he held the combined tracts as an independent kingdom, but eventually submitted to Henry III.

Lloyd, Frank (1889-) motion picture director born in Scotland. After being in musical comedy and stock productions in England and Canada he in 1910 started in motion pictures in the U. S. as an actor, and later as a director. He has turned out several outstanding pictures, including *Cavalcade*, *Mutiny on the Bounty*, and *Under Two Flags*. He has won the Academy award for his able directing on three occasions. In 1936 he became an associate producer.

Lloyd George, David (1863-1945), English statesman, born in Manchester of old Welsh stock, and on his father's death, in 1864, was taken to the village of Llanystymdwy, Wales, where he was brought up by his mother's brother, Richard Lloyd. He early became interested in politics, identifying himself with the Liberal Party; and in 1890 entered Parliament from Carnarvon. He was an ardent supporter of the Welsh Disestablishment Bill. In 1908, he was made Chancellor of the Exchequer. His administration of that office opened a new era in the fiscal history of the United Kingdom. His budgets were so constructed as to place the burden of taxation on unproductive, inherited, and ultra-profitable property, while small manufacturers and dealers and the great body of employees were aided by the passage of Old Age Pensions and National Insurance. From the beginning of the European War in 1914, Lloyd George urged the importance for Great Britain of an adequate supply of munitions. He secured the passage of a bill giving the government power to take over any works suitable for their manufacture;

and from Aug. 6, 1914, to June 15, 1915, was chiefly instrumental in having Parliament pledge the nation to the enormous sum of \$4,310,000,000 for carrying on the war. On the formation of the Coalition Cabinet, in May, 1915, he accepted the newly created office of Minister of Munitions, and completely reorganized the system of munitions production. In July, 1916, on the sudden death of Lord Kitchener, he succeeded as Secretary for War; and on Dec. 7, 1916, succeeded H. H. Asquith as Prime Minister of England with almost absolute powers in the conduct of the war. (see EUROPE, GREAT WAR OF). He was Prime Minister and First Lord of the Treasury, 1916-1922. In 1920 he helped to establish the Irish Free State. Consult *Lives* by J. H. Edwards (3 vols., 1913-16) and H. Du Parcq (1915); B. Evans' *The Life Romance of Lloyd George* (1915); E. W. Walters' *The 'New' Lloyd George* (1916).

Lloyd, Harold (1894-), motion picture actor. He began his career at the age of nineteen. He organized his own 'corporation' in 1923, its first picture being *Girl Shy*. His first talking picture was *Welcome Danger*. He has since starred in *The Cat's-Paw*.

Lloyd's is the familiar name employed to designate the great association of marine underwriters in London. Toward the end of the seventeenth century a coffee house was opened in Tower Street, London, by a Welshman named Edward Lloyd, and here the institution originated. In 1692 its proprietor began to attract underwriters and shippers as customers in increasing numbers. Sales of ships, shipping material, cargoes, and miscellaneous wares were frequent. Gradually the transactions at Lloyd's became more and more connected with exclusively maritime business, and especially with marine insurance. Shortly after 1726 *Lloyd's List* began to be issued. In 1774 Lloyd's moved into the first floor of the Royal Exchange, where they have since remained. The French wars gave a tremendous impetus to the business of Lloyd's, and the risks which its members were able to take and to meet successfully attracted marine insurance trade to London from all over the world. In 1871 Lloyd's was incorporated by Act of Parliament. The corporation as such is not responsible for the liabilities in the individual underwriters who compose it, but before election each member has to place security for those liabilities in the hands of the committee. There are now over 600 underwriting members. The institution has a most com-

pletely equipped system of shipping intelligence all over the world. See INSURANCE, MARINE.

Lloyd's Register of British and Foreign Shipping is a society whose primary object is the classification of vessels. It is managed by a committee composed of merchants, ship-owners, and underwriters, elected at the principal ports of Great Britain. Its authority as a classification society is recognized all over the world. The society issues annually a register book containing very complete information regarding all sea-going vessels whether British or foreign; it also publishes annually a yacht register and a register of American yachts. For a more detailed history of this society, see *Annals of Lloyd's Register* (1884).

Loach, a small fresh-water fish allied to the carp, which belongs to the sub-family Cobitinae, of the family Cyprinidae. Loaches are confined to Europe and Asia.

Load-line, a line marked on a vessel, as required by British law, to indicate the maximum depth to which the ship may be immersed by loading.

Loan, a contract by which the temporary use of a thing is given by the owner to another person. The property in the goods lent passes to the borrower, and if they are lost or destroyed, the borrower bears the loss. When money is lent, interest is not payable if there is no agreement, but under many circumstances an agreement is implied.

Loasa, a genus mostly of sub-tropical plants, natives of Chile and Peru, belonging to the order of Loasaceae. Nearly all the species are characterized by stinging hairs, and most are climbing or trailing plants.

Lobelia, a genus of herbaceous plants belonging to the order Campanulaceae. Among the species in the genus are some of the best blue and scarlet flowering plants of our gardens. *L. ermus* is a useful plant for window gardens. It has blue flowers.

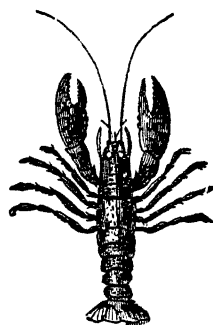
Lobengula (1833-94), king of the Matabele, permitted the British South African Company to settle in Mashonaland. On account of his repeated raids against the Mashonas, he was attacked by the British and after severe fighting was defeated. He died shortly afterwards, deserted by his followers.

Lob Nor, or **Lop-Nor**, lake (mainly fresh water) in the s.e. angle of Chinese Central Asia. Two lakes were formerly distinguished—(1) Kara-Buran, to the w.; and (2) Kara-Kurchin, Kara-Koshun, or Chonkul,

to the e., the name Lob Nor being specially applicable to the latter. The ancient Lob Nor, mentioned by so many travellers, especially Chinese, is now wholly dried up. It lies to the n. of the present Kara-Koshun, almost exactly at the same level, and is only separated from it by an insignificant rise of ground. Sven Hedin, in 1901, noted the tendency of the lake to return to its ancient bed. Among modern Europeans, the great Russian traveller Prejevalski was the first to visit it and scientifically and adequately describe this remarkable basin.

Lobos Islands, or **Seal Islands**, two small groups of rocky islets in the Pacific, some 12 m. off the coast of prov. Lambayeque, Peru, S. America. They have rich deposits of guano.

Lobsters are long-tailed (macrurous) decapod Crustacea, valuable as food. Of all the lobsters, those of greatest commercial importance are the common lobsters of eastern N. America (*Homarus americanus*) and its near



Common Lobster.

ally the European lobster (*H. vulgaris*). When hatched the young are very unlike the mother, but resemble certain transparent shrimplike Crustacea (Mysis). They immediately rise to the surface, and swim by means of two vigorous feathered, oar-like feet, devouring any animal small enough to be overcome. This free life continues for five or six weeks, during which they grow rapidly, moult six times and finally, putting on in miniature the adult form, sink to the bottom and crawl into shallow water. On the approach of winter all the lobsters migrate into deeper and warmer waters; old ones wander much at all seasons. Lobsters are captured in wicker traps or 'pots,' anchored on the rocky shallows where they congregate, and baited with flesh. Much suc-

cess has attended the experiments of the U. S. Fish Commission in artificial propagation and planting of these valuable crustaceans. Many other species of lobsters exist, and are important as food in various parts of the world. Consult U. S. Fish Commission's *Bulletin, No. 15*; Herrick's *The American Lobster*; *Annual Reports* of the Commissioners of Inland Fisheries of Rhode Island.

Local Government. In all the important countries of the world there have been established, in addition to the organs of the central or national government, local authorities having jurisdiction of public affairs in various local districts, as provinces, departments, counties, cities, and boroughs. These local districts and the local officials are in some instances old historical institutions; but for the most part the present system of local authorities and their powers have been established or reorganized within comparatively recent times. There are wide differences in the local areas, the powers and functions of local officials, and the extent of central supervision. Local government in the United States is regulated by each State, and is marked by a wide diversity both in the areas of administration and the powers of local officials. Local officials are distinctly subordinate to the State, and, subject to some restrictions in the State constitutions, are under the legal control of the State legislatures. Most States are divided into counties. These counties are divided into towns, townships, or other districts; and the more compact communities are separately organized as incorporated towns, villages, boroughs and cities. In the Colonial period, three distinctive systems of local government were recognized: In New England the town formed the most important local area, although counties were also of importance in some of these Colonies. In the South, the county was the chief local district. In the middle colonies, the county and town or township divided the functions of local government more nearly equally. These three types have tended to move westward to the newer States, but with an increasing variety of forms. The local administration of justice, care of county buildings, roads, and bridges, and poor relief are the principal branches of county administration.

Every county has also a sheriff, who is chief conservator of the peace and executive officer of the judicial courts. Other elective county officers in most States are the pro-

secuting attorney, treasurer, clerk, and coroners; and in many States there are also county registers of deeds, auditors, assessors, school commissioners, and surveyors. In most States there are also some appointive officials, as poor commissioners and health officers. The principal organ of government in the New England towns is the town meeting, an assembly of the voters held annually and on special occasions. The town meeting elects officers, levies taxes, votes appropriations, and determines the general policy in town affairs. Even greater diversity exists in the forms of municipal organization for urban communities than in the case of counties and towns; and any classification into types is subject to many exceptions. There is a mayor elected by popular vote, and a council or board of aldermen elected by wards into which the city is divided. There are in many of these cities a number of other officers and boards, more or less independent of the mayor and council, and having charge of special branches of municipal activity, as schools, public works, parks, the police and fire departments, and public libraries. Such officials are frequently appointed by the mayor and council, but for definite terms, and removable only for cause; sometimes they are elected directly, and sometimes appointed by the governor of the State. The number of such more or less independent boards and officials and the precise method of organization, vary from city to city; and even in a single city several methods may be employed. See also COMMISSION GOVERNMENT.

An important movement for the betterment of municipal government is for the elimination of 'spoils' politics in the municipal service by the introduction of the merit system, based on open competitive examinations. State boards of health have been created in many States, for the investigation and control of larger sanitary problems. Consult Ashley's *Local and Central Government*; Goodnow's *City Government in the United States and Municipal Government*; Fairlie's *Municipal Administration and Local Government in Counties, Towns, and Villages*; Munro's *Government of European Cities*; Redlich and Hirst's *Local Government in England*; Bourinot's *Local Government in Canada*; McBain and Rogers' *The New Constitutions of Europe* (1922); Toulmin's *The City Manager* (1915); Bradford's *Commission Government in American Cities* (1915); Gilbertson's *The County* (1917);

Clute's *Modern Municipal Charters* (1920); Munro's *The Government of the United States, National, State, Local* (1925).

Local Option, a term used in a special sense for the legal authority granted to a local district, such as a county, city, or town, to determine by popular vote whether the sale of alcoholic beverages shall be permitted or prohibited within the district. The local option system is considered a middle ground between State prohibition and a general system of licensing the liquor traffic.

Locarno, town, Switzerland, in the canton of Ticino, on Lake Maggiore; 15 m. n.w. of Lugano. It is an ancient town, being mentioned historically as early as 789. Here were signed in 1925 the Locarno Treaties on European security; p. 6720.

Locarno Treaties. Following the Great War, security became a major preoccupation of most of the countries of Europe. The treaties concluded at Locarno in 1925 were the culmination of continual efforts to obtain freedom from the fear of attack. The Treaty of Versailles as finally signed gave only a measure of satisfaction to French demands. In the years following the Peace Conference, various European states under the diplomatic leadership of France sought to obtain security by a system of military alliances. Some of the most important of these alliances were the Franco-Belgian alliance (1920), the Franco-Polish alliance (1921), the Franco-Czechoslovak alliance (1924), and the Little Entente (1920-1921). Parallel with these efforts to obtain security by means of alliances was the activity of the League of Nations looking toward disarmament and security. Having reached the conclusion, in 1922, that disarmament is contingent upon security, the League proceeded to draft a general treaty providing for mutual assistance in case of aggression, on the condition of compliance with certain provisions for disarmament, combined with limited defensive alliances. Opposition to some of its features developed to such an extent that it had to be abandoned. The 1924 Assembly of the League of Nations worked out the Proctol for the Pacific Settlement of International Disputes, commonly known as the Geneva Proctol (1924), which linked security and disarmament with arbitration. The Proctol, though signed by eighteen states, was rejected by the British government in March 1925, and thus doomed to be discarded, at least temporarily. The various security projects so far discussed were

all directed, explicitly or by implication, against Germany and her allies in the Great War. On Feb. 9, 1925, the German government presented a note to the French government, making suggestions in regard to a pact of non-aggression, mutual guarantee, and arbitration. Finally a basis for negotiations was agreed upon, and on October 5, 1925, the representatives of Belgium, Czechoslovakia, France, Germany, Great Britain, Italy and Poland, met at Locarno to conclude a number of agreements looking toward security. After two week's informal and friendly negotiation nine agreements were drafted and initialed—a general preamble, seven Treaties, and a letter.

The Preamble, called technically 'The Final Proctol,' was signed by all of the countries represented—Germany, Belgium, France, Great Britain, Italy, Poland, and Czechoslovakia. In it the signatories declared their intention to establish through common accord the 'means for preserving their respective nations from the scourge of war and for providing for the peaceful settlement of disputes of every nature which might eventually arise between them.' They pledged themselves to co-operate sincerely in the efforts already undertaken by the League of Nations looking towards disarmament, and in seeking its realization through a general entente. The seven Treaties may logically be divided into three classes: The Treaty of Security and Mutual Guarantee (The Rhineland Pact), the most far-reaching of all the treaties, was signed by Germany, Belgium, France, Great Britain, and Italy. Individually and collectively, all of the signatories guaranteed the maintenance of the treaty boundaries in the West, and the inviolability of the demilitarized zone as defined in the Treaty of Versailles. France and Belgium on the one hand, and Germany on the other, agreed never to attack each other or invade the territory of the other, and never in any case to go to war with each other, except (a) in the exercise of the right of legitimate defence, or (b) in application of Article xvi. of the Covenant of the League of Nations (the 'Sanctions' Article), or (c) in the case of an action taken at the request of or as a result of a decision of the Council of the Assembly of the League of Nations, or against an aggressor in pursuance of Article xv., paragraph 7, of the Covenant (permitting States to use their own discretion after the Council has failed to reach a unanimous decision). Ger-

many and Belgium, and Germany and France, pledged themselves to settle by peaceful means all questions, through the Council of the League of Nations, and the parties concerned pledged themselves in advance to accept the decisions rendered.

In case of flagrant violation of the Treaty, each of the signatories pledged itself to go immediately to the assistance of the party attacked, without waiting for any action by the Council. None the less, in this case the Council of the League of Nations before which the question has been brought will announce its decision, and the parties to the Treaty pledged themselves to act in accordance with such recommendation if reached by unanimous vote other than that of the representatives of the parties which have engaged in hostilities. The second class of treaties included four arbitration treaties between Germany and France, Germany and Belgium, Germany and Poland, and Germany and Czechoslovakia. (1) All *justiciable questions* which may arise between the signatory parties and which cannot be settled by the ordinary diplomatic procedure, will be submitted for settlement either to an arbitral tribunal or to the Permanent Court of International Justice. This sweeping commitment is weakened by the following qualification, whose meaning is far from clear: 'This provision does not apply to disputes arising out of events prior to the present Convention and belonging to the past.' Failing agreement before the Permanent Commission of Conciliation, a justiciable question is to be referred by means of a special agreement (*par voie de compromis*) either to the Permanent Court of International Justice or to an arbitral tribunal under the conditions laid down in the Hague Conventions of 1907. A very important step in advance is the additional provision that in default of agreement between the parties on the terms of the 'compromis,' one or the other of them may bring the dispute directly before the Permanent Court of International Justice by means of an application. (2) All *non-justiciable questions* which cannot be settled by diplomatic means will be submitted to the Permanent Commission of Conciliation, which will be charged with suggesting to the parties an acceptable solution, and in every case with presenting a report. If within a month after the ending of the labors of the Permanent Commission of Conciliation the two parties are not in agreement, the question will, at the request of one of the

parties, be brought before the Council of the League of Nations under the terms of Article xv. of the Covenant. (3) In every case, and particularly if the dispute which divides the parties is the result of actions already taken by one of the parties or of an action about to be taken, the Commission of Conciliation or the arbitral tribunal or the Permanent Court of International Justice will lay down in the shortest possible time whatever provisional measures should be taken; the signatory powers agreed to accept these.

The third class contains the two Guarantee Treaties between France and Poland, and France and Czechoslovakia. These are in effect France's guarantee, always within the provisions of the Covenant of the League of Nations, to give her eastern Allies immediate assistance in the event of unprovoked aggression against them by Germany. The ninth document was the draft of a letter to be sent, after the signing of the treaties, to the German delegation. This letter was signed by the representatives of Belgium, France, Great Britain, Italy, Czechoslovakia, and Poland. The substance of this communication was intended to satisfy Germany's doubts as to Article xvi. of the League of Nations Covenant. These nine documents, in addition to which certain informal and unofficial promises were said to have been made to Germany, which, however, were not a part of the official record,—the Preamble, the Treaty of Security, the four Arbitration Treaties, the two French Guarantee Conventions, and the Allies' letter to Germany—are all parts of a single unified peace programme. None became effective until Germany entered the League of Nations, with full rights and full responsibilities. The Locarno treaties constituted the second great bridge, the Dawes Plan being the first, across the yawning chasm of hatred and bitterness and suspicion which the war created and which the peace, in some respects, intensified. They were the logical development of previous attempts to supplement the Covenant and thus give a greater degree of security in middle Europe. One of the immediate results of the 'relaxation of the moral tension between nations' brought about by Locarno was to give new impetus to the League's work for disarmament.

Loches, (ancient *Leuca*), town, France, in the department of Indre-et-Loire, on the Indre River; 23 m. s.e. of Tours. It has a famous castle, built by Charles vii., which was

converted into a state prison during the reign of Louis XI; p. 5,000.

Locke, John (1632-1704), the parent and representative of English philosophical thought in the 18th century, was born at Wrington, in Somersetshire. It was at Oxford that Locke was directed to his life-work. A growing taste for experiment in nature engaged him in the end in physical research and the study of medicine, and before 1666 he engaged in medical practice. In 1667 Lord Ashley became his patron. In 1672 he was made secretary of the Board of Trade under Lord Shaftesbury, in which office, with Exeter House for his home, he worked with 'singular exactness' till 1675, when Shaftesbury quarrelled with the court, and resigned. Thus relieved of official cares, Locke retired for four years to France. It was then that the chief enterprise of his life took shape in the form of the *Essay concerning Human Understanding*, published fifteen years later. In 1679 he returned to London, and resumed his place in Shaftesbury's household. He was unjustly suspected of treason on account of his relations with Shaftesbury, and before the end of 1683 he was an exile in Holland. In 1688 the course of English politics opened Locke's way back to England. He returned to begin his life of authorship—for him a new career. His first appearance took the form of a characteristic *Letter for Toleration*, which occasioned controversy, and drew from Locke a *Second Letter for Toleration* in 1690. In the same year he published his famous *An Essay on Civil Government*, in vindication of the principles of the revolution. But 1690 is chiefly memorable in Locke's history for the publication of the famous *Essay concerning Human Understanding*. Animated by the modern spirit, Locke saw in 'experience' the measure of human knowledge of the realities amidst which man finds himself. The critical analysis of our knowledge, initiated by Locke and elaborated by Kant, opened the way to a new philosophical attitude. The *Essay* secured an extraordinary popularity, unprecedented in the case of a philosophical treatise. Locke's name has been associated with an elaborate and impractical constitution (Fundamental Constitution) drawn up for Carolina in 1669, but never put fully into operation and entirely abandoned in 1693. Locke was appointed secretary to the Carolina proprietors, and seems to have retained an active interest in the scheme until 1672. He lived as a member of the Masham

family during the remaining years of his life. To this period belong many further works, including financial tracts on the *Rate of Interest* (1691) and on the *Coining of Silver* (1695); an *Essay on the Reasonableness of Christianity* (1695), followed by *Vindications* (1695); three elaborate *Letters* concerning doubtful passages in the *Essay* and a fourth edition of the *Essay*. The last four years of Locke's life were largely devoted to exegetical annotation of the *Epistles of St. Paul*. Many collected editions of Locke's *Works* have been published. Consult Leibniz' *Nouveaux essais*; Fowler's *Locke in 'English Men of Letters'*; Russell's *The Philosophy of Locke*.

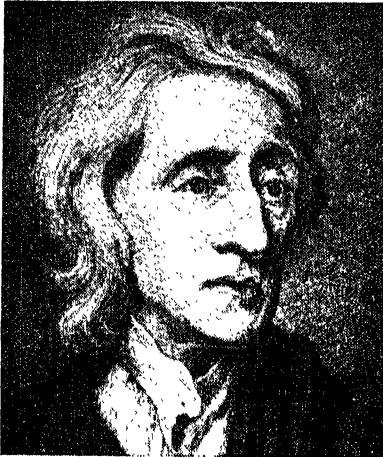
Locke, William John (1863-1930), English novelist, from 1897 to 1907 was secretary of the Royal Institute of British Architects. After 1905 he devoted himself to novel writing. His numerous very popular publications include *The Beloved Vagabond* (1906); *Stella Maris* (1913); *Jaffery* (1915); *The Mountebank* (1921); *The House of Baltazar* (1920); *The Town of Tombarel* (1930).

Lockhart, John Gibson (1794-1854), biographer of Sir Walter Scott, was born in Cambusnethan, Scotland. He contributed frequently to *Blackwood's Magazine*, and is believed to have collaborated with James Hogg in the *Chaldee Manuscript*. In 1818 Lockhart made the acquaintance of Sir Walter Scott, and in 1820 married Scott's daughter Sophia. In 1825 Lockhart accepted the editorship of the *Quarterly Review*, which he conducted with marked success until 1853. In 1836-8 appeared his *Life of Scott*—his greatest work. Lockhart also published four novels, a life of Burns and of Napoleon, and other works.

Lockport, city, New York, co. seat of Niagara co. The New York Central Railroad bridge, spanning the barge canal, is 500 ft. in length and 60 ft. above the canal. Manufactures include, iron, paper, textiles. There are quarries of Niagara limestone in the neighborhood, and an important grain and fruit trade is carried on. Lockport was settled about 1810 and incorporated in 1829; p. 24,379.

Locks and Keys. Primitive fastenings consisted of intricately knotted thongs, seals, or the branch or plain wooden bar placed across the inside of a door. From the horizontal wooden bar, made at an early period to slide in staples on the back of the door and to fit a hole in the door-post, has arisen

the modern lock. To move such a bar through a hole from the outside, or to release whatever held it, a cranked or curved piece of metal with straight handle would be suitable. Such hook-like or sickle-shaped keys have been found in many parts of northern Europe. It is obvious that the simplest method to prevent the bolt or bar from sliding would be to bore a vertical hole into it through the top of one of its

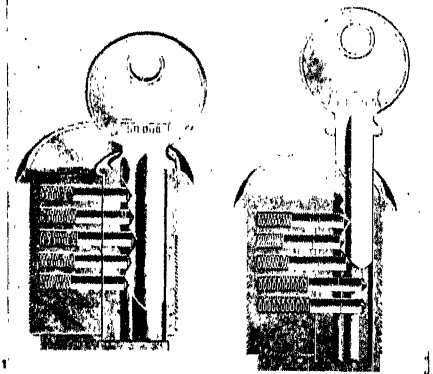


John Locke.

staples, and to insert a dropping peg into the hole. In this case the function of the key would be first of all to remove the peg by lifting it up, thus giving freedom to the bolt. The Egyptians fashioned their locks upon this idea. The commonest form of the Roman lock is essentially based on that of Egypt, but the bolt is a small one, often of bronze. The Romans, however, had many other varieties of locks, prominent among them being those in which the bolt was kept locked by the projection of an expanding spring or springs, the end of which butted against a stop. Early English and mediæval keys of bronze have their 'bows' formed in ecclesiastical shapes—lozenges, trefoils, quatrefoils, and the like. From an early date, and onwards to the close of the 18th century, the chief method adopted to attain security (with the exception of the letter padlock) was the use of fixed internal obstruction in the lock case. The first advance in the mechanics of modern lock-making was made in 1774, by Barron, who placed two pivoted catches or tumblers to guard the bolt, instead of one only. The

Chubb detector lock was originally patented in 1818, and has been altered, added to, and improved many times since that date. After the key has been introduced into the lock and turned about ninety degrees, it commences to lift the tumblers. The keyhole is protected by a barrel and disc, which entirely close it up while the key is being turned. If a pick or wrong key is introduced into the lock which lifts any one of the tumblers beyond its proper height, the lock cannot be opened in its ordinary way, even by its proper key; and the owner, therefore, is notified by the lock itself that some unauthorized person has been tampering with it. This lock as passed out of use except in a few of the Spanish-American countries. The principle, however, is applied in a number of simpler locks.

The Yale lock was invented by Linus Yale Jr., who obtained patents for it in 1861 and in 1865. It consists of a barrel which turns in a cylinder to move the bolt. It is a 'tumbler' lock, having three to five divided pin tumblers which are gradually raised by the key until they are all exactly to the line between the barrel and the cylinder, both the small flat key and the keywork having a peculiar form of cross section, making these parts interlocking throughout their length. Little change was made in these locks for about



twenty years, although different makers used different irregular forms of key and keyway, all designed to afford a special degree of security against picking tools. A series of locks said to be 'master-keyed' has been produced which may be operated by an individual key and also a master key. The master is made to operate different pin tumblers from the individual. Thus a master may be made to operate all the locks in a building, while the individual will operate its own lock

only. The dial or combination lock is the one chiefly used on safes in the United States. It consists of concentric discs or wheels, each having a notch on its edge. On the outside of the safe a dial is mounted on the spindle which passes through the door to work the wheels. The circumference of the dial is divided into one hundred divisions, and the operator has to turn it successively to the right and left until the notches of the discs all coincide, when a 'dog' or catch falls into them, withdrawing the bolt of the lock as it falls. A most important development in recent years has been the application of watch or time movements, so as to regulate the period during which an obstructing bolt is to be kept in its locked position. In setting this lock, it is only necessary to wind up each 'movement' for the predetermined number of hours that the safe door is to remain shut, and this precludes the use of any other locks with which the door may also be fitted until the proper time for opening has arrived. Three types of locks are now in common use: cylinder locks (pin tumbler), lever-tumbler locks (secure lever), and warded locks (fixed side or end wards). A cylinder lock is one in which the obstacle consists of a series of pin tumblers; it is the most secure of all locks. A lever-tumbler lock is one where the obstacle consists of one or more flat tumblers, usually pivoted, which must be moved to certain positions by the key to permit the bolt to be operated. A warded lock is one in which the obstacle consists of fixed wards or ribs which the key must pass to permit the bolt to be operated. Four types of keys are used for the different types of lock: the solid round key, the flat key, the barrel key, and the cylinder-lock key. The variations in the bittings of a key and the corresponding variations in the tumblers or wards of the lock are known as key changes.

Lockwood, Belva Ann (1830-1917), an American lawyer and reformer, was born in Royalton, N. Y., the daughter of Lewis J. Bennett. She was married in 1848 to U. H. McNall, who died in 1853, and in 1868 to Dr. E. Lockwood, who died in 1877. Having graduated (1857) from Genesee College, N. Y., she engaged in teaching from 1857 to 1868, then took up the study of law, was graduated (1873) in that subject from the National University, Washington, D. C., and was admitted to the Washington bar. She obtained congressional action in favor of the admission of mem-

bers of her sex to practice before the U. S. Supreme Court, and was herself admitted to practice in that court in 1879. Her activity in temperance and woman suffrage matters caused her nomination in 1884 and 1888 as presidential candidate of the Equal Rights party, and she held numerous official positions in Woman's Rights and Peace organizations, also serving on government commissions. She wrote and lectured on the reforms which she advocated, and gave much attention and personal service to the rights of Indians.

Lockwood, James Booth (1852-84), explorer, was born in Annapolis, Md., where his father, Gen. H. H. Lockwood, was professor in the U. S. Naval Academy. After several years' service in the West, he joined the Arctic expedition under Lieut. A. W. Greely to Lady Franklin Bay, sailing in the *Proteus* in the summer of 1881. He, with Sergeant Brainard, reached the farthest northern point up to that time attained—an island on the Greenland coast in lat. 83° 24'30" n. Lieutenant Lockwood died of privation at the Cape Sabine camp two months and a half before the rescue of the Greely party by Commander Schley. Consult Greely's *Three Years of Arctic Service*.

Lockyer, Sir Joseph Norman (1836-1920), English astronomer, became director of the Hill Observatory near Sidmouth. He independently originated (1868) the spectroscopic method of daylight chromospheric observation, and led eight eclipse expeditions (1870-1905). Theories of celestial dissociation and sidereal evolution from meteor swarms were advocated in his *Chemistry of the Sun* (1887). Among his other works are *Stonehenge and Other British Stone Monuments Astronomically Considered* (1906); *Surveying for Archaeologists* (1909). He was knighted in 1897.

Loco-Focos, the name given to a faction of the Democratic Party in New York in 1835-7, more correctly known as the Equal Rights Party; also, in popular usage for some years as a designation of the Democratic party in general. They advocated 'hard' as opposed to paper money, opposed monopolies of every kind and the granting of special privileges to any corporation. President Van Buren having expressed in his message of Sept. 4, 1837, views which conformed with those of the Loco-Focos, the latter, regarding him as their spokesman, returned to the ranks of the Democratic Party. The nickname of the faction was given to it in al-

lusion to an incident occurring in 1835, when in a contest for the control of a meeting between the Equal Rights faction and the regular (Tammany) faction, the Tammany men turned out the gas and withdrew, whereupon the Equal Rights men again lighted the hall with candles and loco-foco matches and proceeded with the business of the meeting.

Locomotive, a self-propelled vehicle running on rails and capable of hauling other vehicles. Locomotives are operated by steam, electricity, compressed air, gas from volatile oils, and the combustion of heavy oils. In tracing the development of steam motive power for railroads, credit must be given to Nicholas Joseph Cugnot as the first to utilize a steam engine for moving a vehicle, for though his steam carriage, built in Paris in 1769, was not designed to operate on rails, it contained the principle of propulsion that was later applied in the locomotive. The first steam locomotive built to run on rails was constructed in 1803 by Richard Trevithick in South Wales. In 1813 Timothy Hackworth and William Hedley built a locomotive known as *Puffing Billy*, which was a practical success and was the first locomotive used commercially in hauling cars. George Stephenson built his first locomotive in 1814. The first locomotive operated in America was the Stourbridge *Lion*, built in England and tried out on the railroad of the Delaware & Hudson Canal Company in 1829. The Camden & Amboy Railroad placed an English locomotive, the *John Bull*, in service in 1831. The first locomotive built in America was constructed by the West Point Foundry for the South Carolina Canal & Railroad Company and was christened *The Best Friend of Charleston*. The *DeWitt Clinton*, built for the Mohawk & Hudson, was the third locomotive built by the West Point Foundry. It made its trial trip on Aug. 9, 1831.

To satisfy the popular interest in the new motive power, the Philadelphia Museum in 1831 asked M. W. Baldwin to construct a miniature locomotive. This operated so successfully that he received an order for a full sized locomotive from the Philadelphia, Germantown & Norristown Railroad, which led to the building of *Old Ironsides* in 1832, after which he continued to build locomotives, effecting numerous improvements in their design. Others who influenced early locomotive development in America were Peter Cooper, who built the *Tom Thumb*,

a locomotive of only 1½ H.P., but which proved quite successful, and Ross Winans, assistant master of machinery of the Baltimore & Ohio, who introduced relatively heavy locomotives on that line. One of the outstanding features of American motive power was the use of a swiveling or swinging truck on both passenger and freight locomotives to give a more flexible wheel base and to guide the engine on curves. One of the most satisfactory wheel arrangements for locomotives of moderate size was introduced in 1836—the American or eight-wheel type, which has a four-wheel swiveled leading truck and two pairs of driving wheels.

As the weight of trains increased and heavier motive power was needed, other wheel arrangements were adopted, first for freight and later for passenger service. At present numerous types are in use, each one particularly adapted for some special condition. To identify these types the Whyte classification is now generally used, the locomotive being designated by the number of leading truck wheels, driving wheels, and trailing truck wheels, beginning at the forward or pilot end.

The designs which superseded the American type for freight service all had more driving wheels, thus affording increased weight which could be utilized for traction. This was the reason for the adoption of the 2-6-0 or Mogul type (1867), the 4-6-0 or 10-wheel type (1852), and the 2-8-0 or Consolidation type (1866). In passenger service 10-wheel locomotives were adopted to some extent, but the types with trailing wheels which permitted the use of a wide, deep firebox proved more satisfactory, and the Atlantic and later the Pacific and Mountain types came into general use. Early locomotives used wood as fuel and had 'balloon' stacks to catch the sparks. Both bituminous and anthracite coal soon came into use, however, and these fuels had almost entirely displaced wood by about 1870. Modern locomotives burn hard or soft coal or oil.

The hauling power of a locomotive is limited at starting by the weight on the driving wheels. If the tractive force set up by the pressure of steam on the pistons is more than about one-fourth of this so-called adhesive weight, the drivers will slip. A locomotive designed to start and haul heavy loads must, therefore, have a large proportion of its weight on the driving wheels. The capacity of a locomotive at high speed, on the other hand, is limited by the output of the boiler. Therefore, a fast passenger locomotive

must have a relatively large boiler. These considerations have led to the principal differences in design—freight locomotives, having small driving wheels carrying a large proportion of the total weight; passenger locomotives, having fewer and larger wheels and leading and trailing trucks to enable them to carry a larger boiler.

The economy of steam engines can be increased by expanding the steam through two or more cylinders in succession and this method, called compounding, is generally used in stationary power plants. Various methods of compounding have been applied to locomotives, but it has been found in many cases that the increased cost of maintenance offsets the fuel economy, and during recent years few have been built with the exception of the Mallet type. The simplest system of compounding used on locomotives is the cross-compound, in which the high pressure cylinder is on one side of the locomotive and the low pressure cylinder on the other. The four-cylinder balanced compound has two cylinders inside the frames and two outside, the inner and outer pistons on each side moving in opposite directions, thus causing the inertia forces to balance each other. Mallet compound locomotives have two high pressure cylinders on the rear frame and two low pressure cylinders on the front frame. This system is now used extensively for the largest freight locomotives.

However great the ability of the motive power to haul heavy trains or to attain high speeds, operation would be unsafe unless the engineer had the stopping of the train under complete control. For this reason the air brake has been one of the most important factors in making possible the use of large locomotives. Early railroad equipment was fitted with brake blocks, which were forced against the wheels by hand-operated levers. Later the present type of hand brake was developed, the trainmen setting the brakes on each car when the train was to be stopped, and after various attempts to design a power-operated device that would enable the engineer to apply brakes on the entire train from the cab, George Westinghouse brought out the straight air brake in 1869. Three years later he originated the automatic air brake, so named because it applies automatically in case of a break-in-two. To improve the operation on long trains, especially in emergency, the quick action brake was developed in 1887, making it possible to apply the brake throughout a 50-car train in six seconds.

Further improvements have since been made, and present day equipment gives remarkable control under all conditions.

Small locomotives for switching or local passenger service are sometimes built with space for water and coal storage on the locomotive instead of having a separate tender. These are of two general designs, termed side tank and saddle tank locomotives. Coal which is very finely pulverized can be burned in suspension in the air. This type of fuel has been applied to a few locomotives, principally in foreign countries. Turbine-driven locomotives have been built in Italy, Switzerland, and Sweden. For operation over uneven tracks and steep grades, as on logging roads, geared locomotives are frequently used. Diesel engines, which give very high fuel efficiency and can be built in large units, are used in the most recent types of locomotives.

In 1829 when Stephenson's *Rocket* attained a speed of $29\frac{1}{2}$ m. an hour it was considered a remarkable achievement, but within a few years far higher speeds were made. During the early years of railroading some locomotives were especially designed to make the maximum possible speed, and records of 80 to 90 m. an hour were frequent. The new Diesel locomotives, used on the stream-lined trains, are capable of making 120 m. an hour.

Locomotor Ataxia, or **Tabes Dorsalis**, a nervous disease characterized by inco-ordination of muscular movements, and by trophic and sensory disturbances with involvement of the special senses, of which the eyes are chiefly affected.

Loco Weed, a name applied to a number of plants belonging to the family Leguminosæ, occurring chiefly in the Great Plains region of the West. *Astragalus molissimus*, popularly known as 'purple loco' or 'wooly loco,' is a perennial plant with elliptical leaflets densely covered with hairs, deep purple flowers, and short black pods. It grows to about a foot in height. *Aragallus lamberti*, known as 'white loco,' is more widely distributed than the purple variety, being found as far east as Minnesota and as far west as Western Utah. The flowers are generally white, but may be violet and even purple, and the pods are slender and filled with seeds. It is extremely abundant in Colorado and Montana. The chief importance of the loco weeds is due to their injurious effect upon horses, sheep, and cattle. 'Locoed' animals seem unable to judge of size or distance; sight is impaired, and irregularities in gait are apparent. In the last stages of the disease the animal

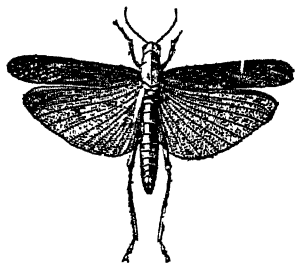
loses flesh and eventually dies of starvation.

Locri Epizephrii, an ancient colony of Locrians in Southern Italy, founded probably about 710 B.C. The city was a model of good government and order and was famed for its code of laws drawn up under Zaleucus about the middle of the 7th century B.C.

Locus, in mathematics, a curve or surface traced out by a point or line which has a limited freedom of motion determined by given geometric conditions. For example, all points in a plane from which a given straight line subtends a right angle lie on a circle with the given line as diameter; in space the locus similarly defined is a sphere.

Locus Delicti. In law, the place where a criminal offence was committed. In an indictment or information the *locus delicti* must be accurately set forth, both in order to show that the crime was committed within the jurisdiction of the court to which the indictment is brought and to define the offence charged so as to enable the accused to plead to the indictment. Upon the trial the proof must conform to the allegation of the indictment in this as in other respects, it being a complete defence to a charge of crime that the accused was elsewhere (*alibi*) than at the place alleged at the time of the commission of the crime.

Locus Standi, in general a person's right to be represented or heard in any litigation or before a legislative body.



Locust (*Pachytylus migratorius*).

Locust, an orthopterous or straight-winged insect belonging to the family Acridiidae. It is found abundantly in all parts of the world and is exceedingly destructive, sometimes laying waste vast areas of fertile land. In the United States the best known species are the Migratory Locust (*Melanoplus spritus*), found in the Western States, where it has at various times caused immense damage to crops; the common Red-legged Locust (*M.*

femur-rubrum); the Two-striped Locust (*M. bivittatus*); the Carolina Locust (*Dissosteira carolina*), common along dusty roads; and the American Locust (*Schistocerca americana*), abundant in the Southern States. The Old World form is *Pachytylus migratorius*, found over a great part of the eastern hemisphere. Other species of *Pachytylus* occur in Africa, and are often excessively destructive. In some of the African forms extensive migrations are undertaken not only by the winged adults, but also by the young, before the development of the wings, when they are locally known as 'voetgangers'. The locust swarms show great indifference to the nature of their food; not only will they devour anything green which comes in their way, but when pressed by hunger, they even attack the young of their own species. The so-called Seventeen-year Locust is not, properly speaking, a locust at all, but a cicada.

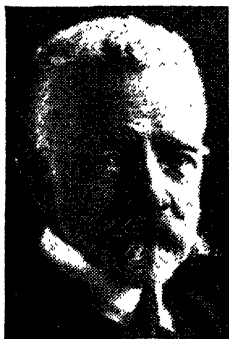
Locust, the name given to several trees and shrubs belonging to the family Leguminosae. They are native to the United States, but have been successfully introduced into various European countries. The Common Locust (*Robinia pseudacacia*) is a tall tree, with a flat-topped head of slender feathery foliage, made up of pinnate leaves. It flowers profusely in May and June, being nearly covered with long pendent racemes of papilionaceous, extremely fragrant with flowers, succeeded by broad brown pods.

Locusta, or **Lucusta**, a notorious female poisoner in ancient Rome; employed by Agrippina to kill her husband the Emperor Claudius, and by Nero to kill Britannicus. She was rewarded with large estates by Nero, but was executed in the reign of his successor, Galba.

Lodes, or **Mineral Veins**, metalliferous deposits occurring in fissures of the earth's crust. In a strict geological sense beds are distinguished from veins by the fact that the former are of contemporaneous, the latter of subsequent, origin to the surrounding rocks; but this distinction is not always observed. Among miners in particular it is customary to regard the word lode as applicable to any zone or belt of mineralized rock lying within boundaries clearly separating it from the neighboring rocks. The contents of the veins include gangue, or worthless mineral matter, and ores, the relative proportion varying greatly in different lodes and in different parts of the same lode. Consult the various publications of the United States Geological Survey.

Lodestone, a variety of magnetite exhibiting marked polarity.

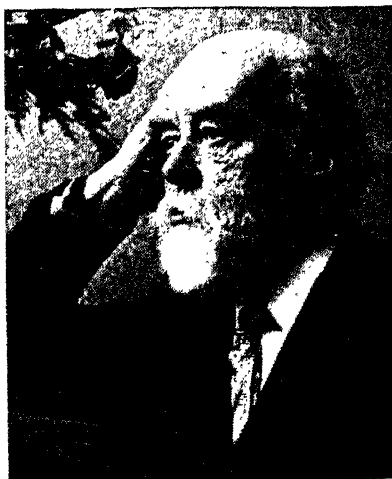
Lodge, Henry Cabot (1850-1924), historian and public official, was born in Boston, Mass., and in 1876 was admitted to the bar. After serving in the Massachusetts legislature, he became chairman of the State central Republican committee. He was a representative in Congress from his State from 1887 to 1893, when he entered the U. S. Senate, to which he was five times re-elected. He achieved a high place in Republican councils, and occupied many important positions in national affairs. A critic of Woodrow Wilson, Lodge played a leading part in the defeat of the Treaty of Versailles in the Senate. Lodge's literary activity began with the *Life and Letters of Hon. George Cabot*, his great-grandfather (1877), and he subsequently published: *A Short History of the English Colonies in America* (1881); *lives of Alexander Hamilton* (1882), *Daniel Webster* (1883), and *George Washington* (1889), in the 'American Statesmen' Series; *Speeches and Addresses* (1910); *One Hundred Years of Peace* (1913).



Henry Cabot Lodge.

Lodge, Sir Oliver Joseph (1851-1940), English physicist and psychical student, was born in Penkhull, Staffordshire. In 1901-4 he was president of the Society for Psychical Research, and in 1913-14 president of the British Association. His numerous papers deal chiefly with electrical science. Sir Oliver's purely scientific work has been supplemented by excursions into the mystic fields of spiritualism and psychical research generally, and he has made public his belief in the possibility of communication between the living and the dead. His published works include: *Elementary Mechanics* (1877); *Modern Views of Electricity* (1889; new ed. 1892) and *Pioneers of Science* (1893; new ed. 1904), which

rank among the best of popular scientific books; *Signalling across Space without Wires* (3d ed. 1900); *The Survival of Man* (1909); *Christopher, a Study in Personality* (1918), etc.



Sir Oliver Joseph Lodge.

Lodge, Thomas (?1558-1625), English poet and pamphleteer, the son of a lord mayor, was born probably in West Ham, Essex. His prose writings include *Rosalynde* (1590), the source of Shakespeare's *As You Like It*.

Lodgings, furnished rooms let by the owner or sublet by a tenant in possession for occupancy for limited periods, usually by the week or month. See **BOARDING HOUSE**.

Lodi, city, California, San Joaquin co., near the Mokelumne River. It is situated in the heart of one of the greatest Tokay grape districts of the world, and has a cannery and seven large fruit packing plants. It is a shipping point for all kinds of tree fruits; p. 11,079.

Lodi, town, Italy, in the province of Milan, Lombardy. Noteworthy features are the cathedral, dating from the 12th century, and the churches of San Lorenzo and the Incorporata, the last erected late in the 15th century. Lodi is celebrated for the manufacture and export of Parmesan cheese. Here in 1796 Napoleon won a victory over the Austrians; p. 28,032.

Lodore', Falls of, a picturesque cataract about 2 m. from Keswick, England. The falls have been immortalized in verse by Southey.

Lodz, city, Poland, in the co. of Lodz, on

the Lukda River; 87 m. s.w. of Warsaw. It is chiefly an industrial town, being the center of the textile industry in Poland. In the Great War, Lodz was occupied by the Germans in December, 1914, after having been taken and lost again two months previously; p. 665,000, mainly Poles, Germans, and Jews.

Loeb, Jacques (1859-1924), experimental physiologist and biologist, was born in Germany. In 1891 he went to the United States. From 1910 until his death he was head of the division of general physiology in the Rockefeller Institute for Medical Research, New York City. He is considered the pioneer in the experimental study of the physiology of protoplasm. He is perhaps best known popularly from the extracts of his publications on the nature of the process of fertilization, and the artificial production of normal larvæ from the unfertilized eggs of the sea urchin. His published works include *Heliotropism of Animals and its Identity with the Heliotropism of Plants* (1890); *Artificial Parthenogenesis and Fertilization* (1913); *Forced Movements, Tropism and Animal Conduct* (1918).

Loeb, Louis (1866-1909), American figure painter and illustrator. He studied in Paris and settled in New York City, devoting himself to illustration. He received many medals and prizes, including a second Hallgarten prize at the National Academy for 'The Mother' (1892), the Webb prize at the Society of American Artists exhibition of 1903 for 'The Dawn,' and two silver medals at St. Louis in 1904.

Loeb, William, Jr. (1866-1937), American public official. He was private secretary to Theodore Roosevelt during the latter's terms as governor of New York State and Vice-President of the United States, and was assistant secretary to President Roosevelt from 1901 to 1903, when he was appointed full secretary. As Collector of Customs at the Port of New York (1909-13) he completely reorganized the Customs House by the removal and prosecution of dishonest officials. In 1913 he became associated with the American Smelting and Refining Company.

Loeffler, Charles Martin (1861-1935), violinist and composer, born in Alsace. He played in orchestras in Paris, Nice, and Lugano, and in 1883 joined the Boston Symphony Orchestra as second leader, resigning in 1903 to devote himself to composition.

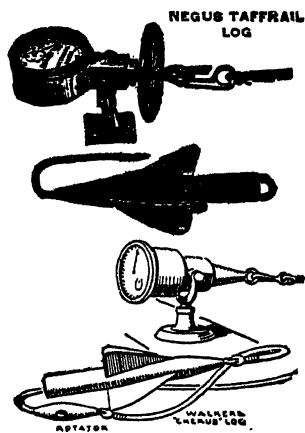
Loess, a peculiar yellowish-brown earth, composed of quartz feldspar, clay, calcite, mica, and other minerals, generally found

along the margins of rivers and on mountain slopes. It is probably an æolian deposit dropped in favoring localities by the wind and accumulated during long periods of time. Its thickness is usually from 10 to 20 ft.

Loewi, Otto (1873-), Austrian physician. Received his M. D. degree from Munich. Professor of pharmacology at the University of Graz. He has written books on albumen synthesis, diabetes, the sympathetic nervous system, and pharmaceuticals. In 1936 he won the Nobel Prize for medicine.

Lofoten, Lofoden or Loffoden, Islands ('Lyn Foot'), a large group of islands, off the northwest coast of Norway, separated from the mainland by the Westfjord; their total area is about 1,500 sq. m. The surrounding waters constitute one of the richest cod and herring fisheries in the world, and the population of the islands consists almost wholly of fishermen and their families, who live along the coasts in tiny villages; the inhabitants number approximately 40,000.

Lofty Mount, highest point (2,334 ft.) of Mt. Lofty Range, South Australia.



Log. An apparatus used to measure a ship's speed. In its simplest form, as invented about 1620, it consists of the log-chip, the log-line, the log-reel, and the log-glass. In American vessels the Bliss or Negus logs are chiefly used. A log of this type has a propeller at the end of a long line. The turning of the propeller causes the line to twist, and this operates a dial mechanism on the taff-rail which shows the actual distance passed over. See **KNOR**.

Log-book, the official journal of all important occurrences in and in connection with a ship. A log-book is usually kept upon printed forms, which are bound up together, containing ruled columns in which are entered the date, the nature and force of the wind, the state of the weather, the course, the currents encountered, the progress made, the performances of the engines, the state of the thermometer and barometer, the observed latitude and longitude, bearings and distances, and other particulars. The official ship's log is kept by the navigating officer in charge, and is initialed by the officer on watch.

Logan, Benjamin (c. 1752-1802), American pioneer, born in Augusta co., Va. While a very young man he moved westward and joined Daniel Boone in the settlement of Kentucky in 1775. His stockade, Logan's Fort, near the present site of Stanford, was attacked by Indians, May 20, 1777, but after a desperate defense was relieved. He sat in the constitutional conventions of 1792 and 1799 and was several times a member of the legislature.

Logan, George (1753-1821), American public man and agriculturist, born at the family residence, 'Stenton,' now a part of Philadelphia. In 1798 he visited France on his own responsibility to persuade the French government to raise the embargo on American shipping. The Federalists in Congress, angry at his action, passed the 'Logan Act,' forbidding a private citizen to take any part in a controversy between the U. S. and a foreign country. He was U. S. senator from Pennsylvania in 1801-07.

Logan, James (1674-1751), American colonial official and savant, born in Lurgan, co., Armagh, Ireland, of Scotch descent. In 1699 he came to Pennsylvania as secretary to William Penn, and during the remainder of his life was prominent in provincial affairs. He was mayor of Philadelphia in 1723, chief-justice of the Supreme Court, president of the Council (1731-39), and acting governor (1736-38). His name appears as one of the original trustees of the school founded in 1749, which afterward grew into the University of Pennsylvania. The order of plants, *Logania*, was named in his honor. He published several controversial and scientific works, including the *Antidote* (1725); *Experimenta de Plantarum Generatione* (Leyden, 1739; London, 1741); and a translation of Cicero's *De Senectute*, which went through several editions, and one of Cato's *Disticks*.

Logan, John (c. 1725-1780), American Indian chief, born in Western Pennsylvania. His name Tah-gah-jute, was changed to Logan in honor of James Logan. He removed to the Ohio river in 1770, and his family was murdered at Yellow Creek by whites in 1774, an outrage attributed, probably unjustly, to Col. Michael Cresap. In revenge Logan is said to have taken thirty scalps himself and he cherished his enmity toward the whites until his death. The well-known 'Speech of Logan' preserved in Thos. Jefferson's *Notes on Virginia* is alleged to have been his reply to Lord Dunmore's summons to a council.

Logan, John Alexander (1826-86), American soldier and politician, born in Jackson co., Ill. In 1858 he was elected to Congress as a Douglas Democrat, and was re-elected in 1860. While attending the extra session of Congress in 1861, he went out with the army and fought at the battle of Bull Run. On Nov. 29 of the same year, he was promoted to major-general of volunteers, and he commanded a division in the Vicksburg campaign. On the capture of the city, he was appointed military governor, assumed command of the Fifteenth Corps, November, 1863, and after the death of Gen. J. B. McPherson commanded the Army of Tennessee until relieved by General Howard. He resigned from the army, August 17, 1865, and in 1866 was elected to Congress as a Republican. He was re-elected in 1868, and again in 1870, but resigned to become a member of the U. S. Senate in 1871. At the expiration of his term in 1877 he returned to the practice of law, but was again a Senator from 1879 until his death. He was a candidate for the Republican nomination for the presidency in 1884, and was unanimously nominated for vice-president on the ticket with Blaine. He wrote *The Great Conspiracy* (1886), and *The Volunteer Soldier of America*, published after his death (1887), in which he attacked existing methods of military training. Consult Dawson's *Life*.

Logan, Mount, a mountain peak of the St. Elias range, in Yukon Territory, Canada, near the Alaskan boundary. It reaches a height of 19,539 ft., being the second highest peak in North America.

Logan, Stephen Trigg (1800-80), American jurist, was born in Franklin co., Ky. He served in the State legislature and helped to draft the Illinois constitution of 1847, having meanwhile (1841-3) had as his law partner the future president, Abraham Lincoln.

Loganberry, a variety of trailing blackberry widely cultivated on the Pacific coast. The fruit resembles the blackberry in shape but is more like the raspberry in color and flavor. It is valued chiefly for canning and for its juice, which is quite tart.

Logan Rock. See **Rocking Stones.**

Logarithms are numbers related to the natural numbers in such a way as to enable us to substitute addition for multiplication and subtraction for division. Their invention by Napier of Merchiston, 1614, constituted one of the most fruitful advances ever made in practical mathematics. The principle of the method is contained in the algebraic law of exponents or indices, which asserts that $a^x \times a^y = a^{x+y}$. If we put $a^x = m$ and $a^y = n$, the quantities x and y are the logarithms of the numbers m and n respectively to base a . If we represent m by its logarithm x , and n by its logarithm y , then the product mn will be represented by the sum $x+y$, and the ratio m/n by the difference $x-y$. Any number may be taken as base, but practically the most convenient base is 10. To this base the logarithm of 10 is 1; of 100, 2; of 1,000, 3; and so on, as indicated in the following table:—

Number.	Logarithm.
1	0
10	1
100	2
1,000	3
10,000	4
100,000	5
1,000,000	6
10,000,000	7
100,000,000	8

Evidently all numbers between 1 and 10 will have logarithms between 0 and 1, numbers between 10 and 100 will have logarithms between 1 and 2, and so on for all sets of numbers intermediate to successive powers of 10. For example, the logarithm of 2 is (to five figures) 0.30103. Since 20 is 10 times 2, the log. of 20 will be the sum of the logs. of 2 and 10—1.30103. Similarly, log. 200=2.30103, log. 2000=3.30103, and so on. It is this property of the logarithms to base 10 which gives the system such a great advantage over systems to other bases. The fractional part of the logarithm is the same for the same succession of figures, quite independent of the position of the decimal point. The decimal point determines between which two powers of 10 the number lies and the number which precedes the fractional part

of the logarithm is known at once by mere inspection. For practical use it is convenient to tabulate the logarithms of all successive numbers to, say, five significant figures. By simple processes of interpolation it is easy to calculate from these the logarithms of numbers given to six or seven significant figures.

Log Cabin and Hard Cider Campaign, the campaign of William Henry Harrison for the presidency of the United States in 1840, so called because Harrison's political opponents had taunted him for living in a log-cabin and drinking nothing better than hard cider. This taunt Harrison's adherents turned into a compliment, log-cabins becoming a party emblem of the Whigs and 'log-cabin' and 'hard cider' party cries.

Logcock, a local name in the United States for the great black pileated woodpecker. See **WOODPECKER.**

Loggerhead, or **Caret**, the largest of the sea-turtles (*Thalassochelys caretta*), inhabits the equatorial zone of the Atlantic, and is especially numerous about the Antilles. It is related to the hawksbill, is covered with bony plates, and sometimes exceeds 400 pounds in weight. The name 'loggerhead' is given also to several birds, whose heads seem notably big and conspicuous.

Loggia, the Italian name for galleries and verandas roofed over, but open on at least one side to the air. In Italy the name is also given to the numerous arcades and porches of public buildings.

Logia, a Greek word (pl.) meaning 'oracles,' applied by Biblical scholars to collections of the *agrapha*, or 'sayings,' of Jesus. That such books of *logia* were actually compiled is demonstrated by the discovery, in the Oxyrhynchite nome, of two papyrus leaves containing eight and five sayings respectively, each beginning with the words 'Jesus said,' published by Grenfell and Hunt (1897 and 1904).

Logic may be most briefly defined, in accordance with the etymology of the word, as the science of reasoning or 'the art of thinking.' It is a scientific account of the laws which regulate the passage in thought from one statement to another, and which must be observed if the thinking process is to be valid. It was Aristotle who first elaborated the idea of the science, and defined its sphere.

In Aristotle's view the essential nature of scientific proof consists in the deductive process by which we pass from universal principles to their necessary consequences. Such proof within any one science therefore de-

pende in the last resort upon those fundamental or ultimate principles, which are assumed as the basis of all our demonstrations in that science, and which cannot themselves be demonstrated in deductive fashion. In view of the degradation of Aristotle's syllogistic logic to a mere formal method of disputation, it is not surprising that thinkers of the modern period, like Bacon and Locke, imbued with the new scientific spirit, should have conceived a strong distaste for such a logic, at any rate as a method of science. This antagonism of the empirical school was not lessened when, later in the modern period, a purely formal conception of logic was expressly put forward and defended on the basis of a rigid distinction between the form and the matter of thought by logicians under the influence of Kant. Such a type of logic was represented in Great Britain by Hamilton and Mansel. J. S. Mill, on the other hand, the contemporary representative of the empirical school, upheld their traditional view by attacking the syllogism as a *petitio principii*, and developing his own analysis of the inductive methods of scientific proof as a real logic of investigation—a logic of truth as opposed to a mere logic of consistency. The purely formal logic of the formal logicians has given rise to a still more extreme symbolic logic, which attempts to express the processes of thinking by mathematical methods and formulæ. (See Venn's *Symbolic Logic*, 2d ed. 1894). And, on the other hand, philosophical logicians have, in a manner, returned to the genuine Aristotelian standpoint, and, treating logic as the theory of knowledge or science, have revindicated for deduction its true place in logical theory. The abstract separation of the form from the matter of thought has been rejected, and a more real interpretation of deductive method has been made possible; while induction is seen, when rightly interpreted, to be simply the inverse process of deduction. (See INDUCTION.) This more philosophical type of logic was revived by Bradley's *Principles of Logic* (1883), a keen criticism of current logical theories, which is followed up by the masterly constructive work of Bosanquet (*Logic*, 2 vols. 1888). The translated works of Lotze and Sigwart have contributed powerfully to the same general tendency to treat logic as a theory of knowledge and scientific method. From such a standpoint logic and epistemology become identical, and no hard and fast line can be drawn between logic and metaphysics. (See ΦΙΛΟΣΟΦΙΑ.) The revival of philosophical

logic in England was due to the influence of German post-Kantian idealism, and partakes of the metaphysical character of the latter; but quite apart from this influence, other important contributions have been made, which are in line with Mill in bringing logic into close relation with science. Of these, Venn's *Empirical Logic* (1889) may be said to be a very valuable revision of Mill, while Jevons's *Principles of Science* (2d ed. 1877) combines the scientific standpoint with symbolic methods. The best recent work on the lines of the older formal logic is Keynes's *Formal Logic* (3d ed. 1894).

Logistics includes all the details of moving and supplying armies and is one of the most important duties of the general staff of an Army in the Field. The different branches of the subject are apportioned to the various divisions and departments of the General Staff. See *Field Regulations*, U. S. Army (1905), and articles under appropriate titles, such as QUARTERMASTER'S DEPARTMENT, etc.

Logogram, a form of puzzle in which, a word having been selected as many anagrams as possible are formed from it. These anagrams themselves are not mentioned; but in the verses which form the puzzle either their synonyms or a description of them is contained. The reader is required from this to guess the original word. See ANAGRAM; also Wheatley's *Anagrams* (1862).

Logone, now part of the n. of Kamerun, Central Africa; consists of a well-wooded plain. Its people are allied to the Makaris and Musgu. Logone is the capital; p. estimated at 250,000.

Logos, a term applied in the prologue of John's Gospel to Jesus Christ. The decisive step of identifying the Logos not only with the Messiah, but with an actual person, Jesus Christ, was taken by St. John. See Liddon's *Bampton Lectures* (1866), Harnack's *History of Doctrine* (1895).

Logwood is obtained from the logwood tree (*Hæmatoxylon campechianum*), which is indigenous to Central America. Logwood is largely used as a red dye, in the manufacture of inks. See DYEING.

Lohengrin, son of Parzifal, and one of the knights of the Holy Grail, whose adventures form the subject of a 13th-century poetical romance. The legend runs that he was conveyed in a car drawn by a swan to Mainz to rescue Elsa, daughter of the Duke of Brabant. After fighting her enemy, Telramund, he married Elsa. His wife, in spite of his dis-

suaſion, endeavored to aſcertain his previous hiſtory. He gave the information, and at once the ſwan and car appeared, and he returned to the Grail. On this ſtory Wagner founded his opera *Lohengrin* (1848).

Loire. (1.) The longest river in France, riſes in Mt. Gerbier-de-Jonc, Cevennes, and finally reaching the Bay of Biſcay between St. Nazaire and Paimbœuf, after a courſe of 620 miles. It paſſes the towns of Roanne, Nevers, Orleans, Blois, Amboiſe, Tours, Ancenis, and Nantes. It is ſubject to frequent floods, and dikes have been conſtructed in ſome parts to prevent deſtructive inundations. The Maritime Canal of the Loire was opened in 1892, between Paimbœuf and Martinière, to enable veſſels to reach Nantes (31 miles) without navigating the ſhallow eſtuary. The Canal Latéral à la Loire accompaniſes the river all the way from Roanne to Briare, from which it proceeds to the Seine. The Loire is alſo connected by canal with the Saône. (2.) Department of central France, formed from parts of the ancient Lyonnais and Forez. It is 1,838 ſq. miles in area, and is largely mountainous. The coal field is one of the richeſt in France, and iron and lead are mined in large quantities. The mineral ſprings of St. Alban, St. Galmier, and Sail-sous-Couzan attract many viſitors. There are three arrondissements—St. Etienne (cap. ſince 1855); Montbrison, in the w.; and Roanne, in the n.; p. 647,633.

Loire, Haute-. See *Haute-Loire*.

Loire-Inférieure, maritime dep. of W. France, formed from part of ancient Brittany. The department is 2,693 ſq. miles in area. Cereals, vines, flax, and fruit are cultivated. The chief induſtries are the manufacture of hemp and linen, and of machinery, eſpecially at Nantes and St. Nazaire. In the latter there is alſo ſhipbuilding. There are five arrondissements—Nantes (cap.), Ancenis, Châteaubriant, Paimbœuf, and St. Nazaire; p. 664,971.

Loiret, dep. of central France, formed from ancient Orléanais and Berry. Area, 2,614 ſq. miles. The plateau of Orleans, occupying the w. and northweſt part of the department, comprises a large tract of land of great fertility. Wheat, ſugar, beet, and the vine are cultivated. Diſtilling and ſugar-refining are carried on, and hosiery and porcelain are manufactured. There are four arrondissements—Orleans (cap.), Gien, Montargis, and Pithiviers; p. 366,660.

Loir-et-Cher, dep. of Central France, formerly part of Orléanais and Touraine. Area, 2,478 ſq. miles, conſiſting moſtly of plain.

Foreſts cover one-sixth of the ſurface. Cereals and fruit are cultivated; other induſtries are ſheep and poultry rearing, bee-keeping; woollens, cottons, leather and glaſs manufactures. There are three arrondissements—Blois (cap.), Romorantin, and Vendôme; p. 275,538.

Loki, one of the principal beings in Scandinavian mythology. He may be regarded as the Scandinavian ‘ſpirit of evil,’ or Norse Mephiſtopheles. See *BALDER*.

Lokman, the name of two perſons in Arabic tradition. The firſt was ſaid to have made the Ma’rib dike, and in reward for his virtues to have been dowered with the lives of ſeven vultures, theſe birds being ſaid each to live eighty years. The other is variously deſcribed as an Abyſſinian ſlave of David’s time, or a relative of Job, or is identified with Balaam, the names poſſeſſing the ſame root meaning, ‘ſwallower’ or ‘devourer.’ See Derenbourg’s *Fables de Loqmân le Sage* (1850), and *The Thousand Nights and a Night*, edited by Lady Burton.

Lolium, a genus of graſſes, of which, perhaps, the moſt valuable member is the Italian rye graſs (*L. italicum*), a poſſible variety of the European paſture graſs (*L. perenne*), moſt uſeful for hay or animal paſture, being too ſhort-lived for lawn or permanent paſture. The darnel (*L. temulentum*) is ſaid to be the ‘tares’ referred to in the Goſpels.

Lollards, a name applied moſt commonly to the followers of Wycliffe. The Lollards were oppoſed, but not actively perſecuted, by Richard II., whoſe wife, Anne of Bohemia, was a Lollard, and actively promoted the cauſe in her native country. On the acceſſion of Henry IV. (1399) the Lollards were ſubjected to violent perſecution. The moſt diſtinguiſhed leader and martyr of the movement was Lord Cobham, executed in 1417. In the early part of the 15th century, in ſpite of vigorous efforts at ſuppreſſion, the movement was widespread and influential. During the Wars of the Roſes the vigor of the perſecutions waned. In Tudor times Lollard opinions gradually triumphed, and in 1547, the firſt year of Edward VI.’s reign, all ſtatutes againſt Lollardism were repealed. See *WYCLIFFE*. Conſult Trevelyan’s *England in the Age of Wycliffe*; Gairdner’s *Lollardy and the Reformation in England* (1908).

Lolos, or *Nesus*, an aboriginal tribe in China, inhabiting the mountainous country Ta-liangshan, lying between the Yang-tse-

kiang and the Chien-chang valley. Their writing is pictographic. Women hold a high position. Consult Legendre's *Le Far West Chinois* (1910).

Lomaria, a genus of coarse ferns (order Polypodiaceæ), with dimorphous fronds, and linear sori occupying the space between the midrib and the edge of the frond. There are 35 species, found chiefly in the Southern Hemisphere.

Lombard, Peter (c. 1100-60), theologian, bishop of Paris, was born in Novara, Lombardy. He obtained a professorship of theology at Paris, and was appointed to the bishopric in 1159. He became famous through his *Sententiarum Libri Quatuor*, a collection of extracts from the fathers, which was widely used by students of theology. His *Works* were edited by Aleaumne.

Lombard Architecture, the type that resulted from the influence of the Lombards on the Byzantine architecture that they found on their arrival in Italy. Typical of the Lombard architecture of the 11th and 12th centuries are the basilica church, with grotesque ornaments of animal forms; the round arch; the plain, square campanili; and the use of terra-cotta, clay being more plentiful in the Po valley than stone or marble. Illustrations of Lombard art are the Church of San Michele at Pavia (eleventh century) and the Duomo of Piacenza.

Lombards, or Longobardi, a German people who, at the beginning of the Christian era, settled on the Lower Elbe, and in the fifth century seem to have migrated to the regions of the Danube, where they became converts to Arianism. Throwing off the yoke of the Herulæ (490), under whose domination they had fallen, they destroyed the Gepidæ (566), took possession of Pannonia, and under Alboin invaded Italy (568). Charlemagne finally subjugated and made their kingdom an imperial province. Consult Brown's *Studies in Venetian History* (1907); Paulus Warnefridus' *History of the Longobards* (ed. by Foulke, 1907); Blasel's *Die Wanderzüge der Longobarden* (1909).

Lombards, those merchants from the commercial cities of Northern Italy who acted as bankers, or rather money-lenders to the kings of England from the time of Henry III. (1216-72) to the time of Edward III. (1327-77). The Lombards had offices in the street in London which still bears their name. Their usurious transactions caused their expulsion from the kingdom by Queen Eliza-

beth. Consult Cunningham's *Growth of English Industry and Commerce*.

Lombardy, division of Northern Italy, being the central part of the long depression between the Alps and the Apennines, drained by the Po and its tributaries, and having Piedmont on the west and Venetia on the east. It covers an area of 9,374 sq. m. On the north and east borders are Lakes Maggiore and Garda, while Como, Iseo, and part of Lugano are included in the territory. The division is noted for its silk manufactures, and for its wine and cheese industries. The chief city is Milan; p. 5,110,000.

HISTORY.—After the conquest of the Lombards by Charlemagne, Lombardy became a part of the Holy Roman Empire. Its cities, however, grew to be republics, vying with one another in politics, commerce, and art. In 1167 they united in the Lombard League against the Emperor Frederick Barbarossa, and were successful in forcing from him favorable terms at the Peace of Constance (1183). In the first half of the sixteenth century the communes passed into the hands of Spain. Two centuries later the territory was captured by Austria, which, except for the interval of Napoleon's conquest, held it until 1859, when Lombardy was annexed to Sardinia. In 1861 it became part of the new kingdom of Italy. Consult Butler's *Lombard Communes* (1906).

Lombok, one of the Lesser Sunda Islands, forming with Bali on the west a residency of the Dutch East Indies. Area, about 2,000 sq. m. Mataram is the capital; Ampanan, on the west coast, is the seaport. Lombok was captured by the Dutch in 1894; p. 350,000. It was occupied by Japanese armed forces in 1942.

Lombroso, Cesare (1836-1909), Italian criminologist, was born in Verona of Jewish parentage. The fundamental points of Lombroso's criminology are that men's actions and modes of thinking are constructed by their physical structure; therefore criminals are in some way physically abnormal; such abnormality, or degeneration, is a pathological state of arrested development, or atavistic reversion; the physical expression of such criminal degeneration is moral insanity. For the occasional criminal he advocates the indeterminate sentence; for the 'born criminal,' complete and permanent isolation. Among his works are *After Death—What?* (1909); *Crime, Its Causes and Remedies* (1911).

Lomond, Loch, between Dumbartonshire and Stirlingshire, Scotland, which from its size and picturesqueness is justly entitled the 'queen of Scottish lakes.' It covers an area of 27.09 sq. m., is 21 m. long and in breadth varies from 5 m. to 1 m., the southern portion being wide and island-studded. On the eastern shore are Balmaha, Rowardennan, and Inversnaid, the center of the Rob Roy country.

Lomza, city, capital of Lomza province, Russian Poland, 75 m. n.e. of Warsaw, on the left bank of the Narev River. During the World War the Russians evacuated the city and the Austro-German forces entered it in August, 1915. There is considerable trade in grain and timber; p. 29,000.

End, the commercial and manufacturing center, including what is popularly known as 'the City.' South of the Thames are a number of separate districts generally known by their particular names, as Wandsworth, Southwark, Battersea, Lambeth, Woolwich, Bermondsey, Camberwell. On the northern outskirts of London is the borough of Hampstead, a residential district; on the south, Dulwich, also popular as a place of residence and containing the famous Crystal Palace, while still farther away to the s.w., open country, are Richmond, Croyden, Hampton Court, Windsor, and Kew, and to the n.e. Epping Forest and Hainault.

The climate is temperate and healthful, with a rainfall somewhat below the average



Photo from Ewing Galloway, N. Y.

The Tower of London.

London, the largest city in the world, the capital of England and of the British empire, stands on both banks of the River Thames, which is both tidal and navigable. Greater London, with the City of London as a nucleus, occupies parts of the counties of Middlesex, Surrey, and Kent, a total area of 443,424 acres. By the Local Government Act of 1888, the area consisting of the City of London and the County of London, covering 74,850 acres, was constituted the administrative County of London. This administrative county is divided into 28 metropolitan boroughs, including the city of Westminster, and excluding the City, which has an area of 678 acres. London is roughly divided by the Thames River into a northern and southern half. The northern half may again be divided due north of Charing Cross to Holloway, into the West End, the fashionable residential district, and the East

for the rest of England. There is much fog, and the extensive use of soft coal causes an annoying amount of smoke. Some of the streets are narrow and irregular, while others are fine, broad thoroughfares. Among the best-known and most important are those included in 'the City' and the West End. Noteworthy among these are Cheapside-Poultry; Threadneedle Street, on which fronts the Bank of England; Cornhill; Lombard Street, the home of the financial houses; St. Paul's Churchyard, a center of the drapers' trade; Paternoster Row, the book publishers' quarter; and Fleet Street, the abode of journalism. The Strand, running n. and n.e. from Trafalgar Squares (just n. of Charing Cross, the center of London), is one of the busiest streets in London, forming a main thoroughfare between the West End and the City. On it are many fine shops, theaters, banks, and hotels. Holborn, forms a pro-

longation of this great thoroughfare, other parts of which are Oxford Street and High Holborn. Chancery Lane, occupied by solicitors, law-stationers, and others connected with the legal profession, runs from Fleet Street to Holborn. Regent Street, noted for its fashionable shops and restaurants, Bond Street, famous for its jewelry shops, and Piccadilly, the home of luxurious clubs and fine residences, are important streets in the West End. Other famous London streets are Pall Mall, running s.w. from Trafalgar Square to St. James Street; Downing Street,

London has many parks, both large and small. Chief among them is the fashionable Hyde Park in the West End, lying between Park Lane and Kensington Gardens, with the latter of which it forms a continuous park of over 600 acres. At its southeastern corner it almost touches the Green Park, which, in its turn, joins St. James Park. In Hyde Park are Rotten Row, a famous riding track, the Serpentine, an artificial lake, and various tea and boat houses. The northern part of the park, a flat and bare expanse, is a favorite place for mass meetings and popu-



Elmendorj Photo, Copyright Ewing Galloway, N. Y.

Mounted Sentinel before Horse Guards Building in Whitehall.

on which stand the Foreign Office and other government offices; the beautiful Victoria Embankment, extending along the left bank of the Thames from Westminster Bridge to Blackfriars Bridge. South from Trafalgar Square run Whitehall and Parliament Street, past the Admiralty, the Horse Guards, beneath whose clock-tower entrance one passes into St. James Park, and other government buildings, ending in the approaches to the Houses of Parliament and Westminster Abbey. North from Trafalgar Square runs Haymarket, leading into Regent Street through Piccadilly Circus.

lar demonstrations. Kensington Gardens, the private gardens of Kensington Palace, cover 275 acres, presented to the nation in 1899. Regent's Park is the largest of London's parks (472 acres) and was a royal hunting ground until the time of Cromwell. Here are the Royal Botanical Gardens, the Zoölogical Gardens, containing over 2,500 animals and 1,600 birds, and Bedford College, one of London University's schools for women. Green Park and St. James Park, with an artificial lake of 5 acres and Buckingham Palace, the London residence of the King at its west end, lie close together, between Piccadilly and White-

hall, both beautifully laid out with trees and shrubs. Victoria Park, to the n.e. of the city, Battersea Park at the s.w., and Greenwich Park at the s.e. are also notable for their extent and beauty. Hampstead Heath, an elevated tract of 616 acres n.w. of the city, is one of the most popular resorts near London. London also has many attractive open squares, the best known of which are Trafalgar, in the very heart of the city, Hanover, Leicester, Bloomsbury, Lincoln's Inn Fields, and Russell. Notable among many monuments are the Nelson column, in Trafalgar Square, of granite surmounted by a colossal figure of Lord Nelson, its base guarded by four bronze lions designed by Landseer; Cleopatra's Needle, on the Thames Embankment, an Egyptian obelisk, 68½ ft. high, companion to the obelisk in Central Park, New York City; the Marble Arch at the northeast corner of Hyde Park; and the Cenotaph in memory of those who died in the World War which stands in Whitehall.

There are fifteen terminal railway stations in London, serving for both long distance and for suburban trains. For communication within the city, including the suburban districts, there are omnibuses, tramways, underground railways, river steamers, and bridges. The airport of London is situated at Croyden, 10 m. s.e. of the city. London is so rich a treasure house of historically interesting buildings that it must suffice here to mention only the most noteworthy. At the east end, fronting the river, not far from London Bridge, is the Tower of London. This ancient fortress, the oldest part of which, the White Tower, dates from shortly after the Conquest, covers an area of nearly 13 acres. It is surrounded by a moat and contains Traitors' Gate, the site of the ancient scaffold, the weapon room in the White Tower, the crown jewels in Wakefield Tower, and St. John's Chapel, the oldest church in London, a fine specimen of Norman architecture. North-east of the Tower, in the heart of the City, are the Bank of England, a low massive building erected early in the 18th century; the Royal Exchange; and the Mansion House, official residence of the Lord Mayor. The Guildhall, on King's Street near Cheapside, dates from 1411. The General Post Office stands a short distance w. of the Guildhall, and n. of that St. Bartholomew's Hospital, the oldest charitable institution in London, retains its original site. Still farther north is the church of St. Bartholomew the Great, an imposing example of Norman architecture.

St. Paul's Cathedral, the largest and most famous church in London, stands at the top of Ludgate Hill, the western limit of 'the City.'

Proceeding westward, the Temple is to be seen. This consists of the two Inns of Court, the Inner Temple and Middle Temple, with the beautiful Temple gardens surrounding them. North and on the other side of the Strand are the Royal Courts of Justice; still farther n. is Lincoln's Inn on the e. side of Lincoln's Inn Fields; and northernmost of all, across Holborn, Gray's Inn, with which is intimately associated the name of Francis Bacon. In the Bloomsbury district are the British Museum and the Foundling Hospital. Dr. Johnson's House, where he was engaged from 1748 to 1758, on his famous *Dictionary*, is on Fleet Street. Grouped around Trafalgar Square are the National Gallery, with the National Portrait Gallery adjoining, the Royal College of Physicians, and the Union Club. Leading directly south from the Square is Whitehall, on which stands the Old Admiralty; immediately behind it, in St. James Park, are the New Admiralty, the Horse Guards, the War Office, the Banqueting Hall (the only relic of the old Palace of Whitehall), the Treasury, and a group of other government offices. Westminster Abbey and the Houses of Parliament are farther to the south, the latter on the banks of the Thames. The Houses of Parliament are an imposing group of buildings in late Gothic style. In the Clock Tower at the western end is 'Big Ben,' a bell weighing nearly 14 tons. At the n.e. corner is Victoria Tower, said to be the loftiest square tower in existence. At the west end of St. James Park is Buckingham Palace; at the east end of Green Park is St. James Palace, a picturesque brick building where the royal levees are still held. Kensington Gardens, the Royal Albert Hall, the Imperial Institute, Natural History Museum and Victoria and Albert Museum are all noteworthy buildings in the vicinity of Kensington Gardens, West End.

Of the many beautiful and interesting churches of London, St. Paul's Cathedral and Westminster Abbey are probably the best known, but many others are of interest both historically and architecturally. Temple Church, belonging to the Inner and Middle Temple, is one of the four remaining round churches in England. Others are St. Margaret's near Westminster Abbey, founded in the 11th century; St. Mary-le-Bow, one of Wren's masterpieces, on Cheapside, about

halfway between St. Paul's and the Bank; Southwark Cathedral, a fine Gothic structure at the south end of London Bridge; St. John's Chapel in the White Tower, the oldest church in London; St. Clement Danes in the Strand, where Dr. Johnson worshipped; St. Martin's in the Fields, at the corner of Trafalgar Square, built by Gibbs in 1721-26; and St. Giles Cripplegate, in the City, famous as the burial place of John Milton. The University of London occupies the central portion and east wing of the Imperial Institute in Kensington as its headquarters. The Imperial College of Science and Technology in Kensington is an extensive and finely equipped institution incorporated in 1907. The Royal College of Physicians is on the west side of Trafalgar Square, and the Royal College of Surgeons on the south side of Lincoln's Inn Fields. Westminster School lies south of the Abbey, and is one of the great public schools of London. St. Paul's School, founded in 1509, is one of the largest secondary day-schools in England and has numbered among its pupils, Milton, Pepys, Marlborough, and Jowett. Nearly all the London boroughs have Free Public Libraries. The British Museum in Bloomsbury is unrivaled in the world for richness and variety of content. The London Museum, which occupies Lancaster House near St. James Palace, has an interesting collection illustrating the history, social life and customs of London, arranged chronologically. The Natural History Museum in South Kensington, a branch of the British Museum, has many zoological and geological specimens and an extensive herbarium. The Victoria and Albert Museum, contains perhaps the largest and finest collection of applied art in the world. The most notable galleries in London are the National Gallery in Trafalgar Square, one of the most representative picture galleries in Europe; the National Portrait Gallery, containing a collection of nearly 2,000 portraits; the Tate Gallery in Grosvenor Road overlooking the Thames, devoted to modern British art; Dulwich Gallery in Gallery Road, built by Sir John Soane and rich in old masters, especially of the Dutch School; the Wallace Collection, housed in Hereford House, Manchester Square, of choice paintings, furniture, porcelain, miniatures and other art treasures; and Hampton Court Palace, just outside the city.

There are about 50 theaters in London and as many more variety or music halls. Drury Lane Theater, in the vicinity of Covent Garden, near the Aldwych, is historically interest-

ing, having been erected originally in 1663 for actors known as the King's Company. Covent Garden Theater is also historic, the first one on this site being opened by John Rich, the harlequin, in 1732. Still another historically interesting theater is the Haymarket, built in 1820 on a site devoted to the theater since 1721. The chief concert halls in London are Queen's Hall in Langham Place, where the Symphony Concerts are given; Royal Albert Hall in S. Kensington and Wigmore Hall, devoted chiefly to song recitals and chamber music. Other places of amusement are Madame Tussaud's famous Waxworks in Marylebone Road and the Crystal Palace, a huge building of iron and glass in Dulwich, where are held concerts, organ recitals, flower shows, dog shows, art exhibitions, fireworks, as well as permanent exhibitions of sculpture, natural history, and architecture. The largest and most fashionable hotels are in the West End, in the Strand, around Piccadilly, in Mayfair and Belgravia. About forty daily papers and hundreds of periodicals are published in London. *The London Gazette*, a government organ published twice weekly, is the oldest newspaper, though the *Public Ledger*, founded in 1759, still survives in name.

The administration of the principal markets of London is in the hands of the Corporation. Billingside is the most ancient market in London. It is mentioned in a proclamation dated 1297, and it was given in evidence before the Royal Commission of 1893 that it was used for the sale of fish a thousand years ago. It claims to be the only market in the world where every known variety of fish is sold. Covent Garden Market is the chief London market for fruit, flowers, and vegetables and when business is flourishing presents a picturesque and animated scene. Market days are Tuesdays, Thursdays, and Saturdays. Some of the London hospitals are very old. St. Bartholomew's in Smithfield was founded in 1123, though the present buildings are of the 18th and 19th centuries; Chelsea Hospital for old and disabled soldiers was built by Sir Christopher Wren, in 1682-92; the Westminster Hospital dates from 1719; the Foundling Hospital in Bloomsbury was founded by Captain Coram in 1739. The London County Council is the local education authority, the education committee being composed of 50 members, including 12 co-opted members, of whom at least 5 must be women. School attendance is compulsory between the ages of five and fourteen. Open air schools are provided for



Photo from Ewing Galloway, N. Y.

Houses of Parliament, London.

delicate children; central schools of a higher type, where the curriculum has a commercial or industrial character, are established when desirable; industrial and reformatory schools, technical institutes, schools of art and day trade schools are also provided.

London industries are enormous and of great variety. Brewing, distilling, sugar refining, silk manufacture, chiefly in Bethnal Green and Spitalfields, tanning, soap making and candle making in Southwark, engineering works in Lambeth and Deptford, watch

the whole is within 15 m. of Charing Cross, is 8,655,000. London is the leading money market of the world, with its center in the Bank of England. The general financial officer of the city is the Comptroller of the Council. The London County Council is the ruling authority for the County of London except in the City of London, which has a separate government. The Local Government Act of 1888 created the new County of London, and provided it with an organization for non-administrative purposes. It also created



Photo from Brown Bros.

The Guildhall.

and clock making in Clerkenwell, are among the principal industries represented. Leather working, saddlery, the manufacture of wall paper, printing and publishing, clothing manufacture, and pottery making are also carried on. The Port of London is the greatest port in the world in the amount of shipping, about one third of the total annual trade of the United Kingdom passing through it. For sea-going ships, generally, the port begins at the Pool, below London Bridge, and all the docks with the exception of Tilbury are within ten miles of that point. The population of what is known as Greater London, which includes all parishes of which any part is within 12 m. of Charing Cross, or of which

the administrative County of London out of the County and the City of London, and directed that a county council should be elected for that area. The London County Council consists of 118 councillors, 19 aldermen, and a chairman. The City of London has a unique government dating back in some of its aspects to the Middle Ages. It is governed by the Lord Mayor, the Courts of Aldermen and the Common Council. There are 26 aldermen, elected for life, and 206 common councillors elected annually. The Lord Mayor is elected yearly from among the aldermen who have served as sheriff, by the livery companies in Common Hall. These livery companies, the successors of the craft guilds, num-

bers 76, of which 12 are known as the 'Great Companies,' these are the Mercers, Grocers, Drapers, Fish Mongers, Goldsmiths, Skinners, Merchant Taylors, Salters, Haberdashers, Ironmongers, Printers and Clothworkers. Two sheriffs are also elected annually by the liverymen. Within the City the Lord Mayor takes precedence of every one. He resides at the Mansion House and has his offices in the Guildhall.

The other local or district administrative authorities in London are the councils of the twenty-eight metropolitan boroughs created by the London Government Act, 1889. The existence of London cannot be traced definitely to prehistoric times. It is described by Aulus Plautius in the 1st century, and only a few years after the Roman conquest, as a great commercial resort. The retirement of the Romans took place about 418. Early in the 7th century London belonged to the East Saxons, and there was founded a Christian church under Mellitus as first bishop. Then the Danish invasions took place, and London, taken by the invaders, lay desolate and deserted until it was recovered by Alfred, who in 866 repaired the defences, and made of London the strongest and, before long, the richest city in the island. After the Norman Conquest a charter was obtained from William the Conqueror, which procured for the citizens a confirmation of the laws and privileges which had been theirs under Edward the Confessor; the Tower of London was built by William as a royal palace and fortress. In the twelfth century Archbishop Thomas à Becket was slain in the Canterbury Cathedral and after his murder became the city's patron saint, a chapel being built in his honor on London Bridge. In the reign of Richard I. the mayoralty, replacing the rule of the portreeves, was established; Henry Fitz Aylwin was chosen the first mayor in 1189, and continued in office until his death in 1212. Magna Charta, granted by King John in 1215, had a special clause in regard to the liberties of the City of London. The Peasants' Revolt under Wat Tyler occurred in 1381 and London was for a time in the hands of the rebels who burned the Savoy Palace and other buildings. Richard Whittington, four times mayor of London between 1396 and 1419, was a wise and just ruler of the city, famous for his charities.

Until the end of the seventh century London spread but little beyond the limits of the mediæval city. The Thames was the great highway, the roads being often impassable.

In June, 1665, London was visited by the plague, which claimed nearly 10,000 victims during its seven months' continuance, and in 1666 occurred the Great Fire, which destroyed fifteen city wards, with over 13,000 houses. The Black Death caused fearful ravages in the 14th century, and during the whole of the 16th and 17th centuries, down to the last visitation in 1665, the streets of London were never wholly free from plague. The boon of a plentiful supply of water, conferred for the first time by the New River Company in 1613, may have done much toward averting more attacks of the disease; while the rebuilding of the city after the fire, raising its level at least six feet, was a notable improvement. Other events of importance in the history of London were the establishment of the Bank of England in 1694; the removal of the city gates in 1760; the Gordon Riots in 1780 (see GORDON, LORD GEORGE), during which Newgate prison was burned; the rebuilding of the many bridges which now span the river; the abolition of imprisonment for debt—an event of the highest importance in a trading city; the development of the great suburban districts and the enormous increase of population; the creating of the London County Council and the metropolitan boroughs. During the Great War London was the object of several Zeppelin raids which caused no little destruction of life and property. The most severe of these occurred in June and October 1915.

When the European War, 1939, broke out several hundreds of thousands of school children and women were removed from London to rural areas to safeguard them from the threat of enemy air raids. Every light in the city was extinguished at night causing many traffic accidents. The city suffered seriously from German air bombings.

London, city, Ontario, Canada, capital of Middlesex co., on the Thames River. It is the seat of Western University and of Huron College (theological), affiliated with the University, and of a provincial normal school. London is situated in a productive agricultural region and is an important trade center. It has large railroad shops and was settled in 1826; p. 61,000.

London, Jack (1876-1916), American author, was born in San Francisco. In 1897 he joined the rush to the Klondike. In 1902 he went to London, and two years later was newspaper correspondent in the Russo-Japanese War. He was war correspondent in Mexico in 1914. Among his books are *The*

Son of the Wolf (1900); *The Call of the Wild* (1903); *The Sea Wolf* (1904); *John Barleycorn* (1913).

London Bridge. See **London.**

London Company, at first a subdivision of a large company which, in April, 1606, was chartered for planting colonies in America, and later, after 1609, a separate joint stock company, officially known as 'The Treasurer and Company of Adventurers and Planters of the City of London for the First Colony in Virginia.' The company's charter was withdrawn and the company itself consequently dissolved in 1624. It was by this company that Jamestown was founded (1607) and that, until 1624, the colony of Virginia was administered. Consult *The Records of the Virginia Company of London*, edited by Kingsbury (1908).

London, Declaration of. See **Contra-band of War.**

Londonderry, maritime co., Ulster, Ireland, with seaboard extending between the River Bann and Lough Foyle. The surface is in great part mountainous but there are many fertile valleys and low-lying tracts. Agriculture is the chief industry, and linen is manufactured. The fisheries are valuable. Area, 816 sq. m.; p. 140,621.

Londonderry, or **Derry,** city, Ireland, seaport and capital of Londonderry co., is situated on a high hill overlooking the left bank of the Foyle. Noteworthy buildings are the Anglican Cathedral, built in 1628-33, and restored 1886-7; the Roman Catholic Cathedral; the court house; and Guildhall, a handsome Gothic building reconstructed after a fire in 1911. There are fine quays and a good harbor, and a large colonial and coasting trade. Shirt making is the most important industry; p. 41,000. Londonderry was founded as an abbey by St. Columba in 546 and during the Danish invasions suffered repeatedly from fire and slaughter. In 1613 James I. granted a charter of incorporation to the London companies and called the place Londonderry. In 1689 King James' Irish army unsuccessfully besieged the city for 105 days.

London Gazette, The, official organ of the British government, has been published now for over two hundred and fifty years.

London, Treaty of. See **Balkan War, 1912-13.**

London, University of, a title originally assumed by the non-sectarian institution afterwards known as University College, London. In 1835 it was decided to institute a

body whose function should be solely an examining one, leaving King's College to teach, but not to examine—at least, not for degrees. A charter constituting such a body (the University of London) was issued by the crown on Nov. 28, 1836. In 1898 by the University of London Act of 1898 provision was made for the reconstitution of the university as a teaching body.

Lone Wolf, a chief of the Kiowa or Gàig-wu tribe of Indians succeeded Dohasān as chief in 1866, not long after the treaty was made with Kit Carson and others confining the Kiowa to Western Texas and what is now Oklahoma. He refused to sign the Medicine Lodge treaty of 1867, but was captured by Custer and at last consented to bring his people to the reservation in 1869. Invasions of the Indians' reservation by white hunters and the unfortunate death of Lone Wolf's son and nephew while raiding in Mexico led the chief to go on the war path again in 1874. He surrendered to General Scofield in February 1875, and was sent to Fort Marion, Fla., and placed in military confinement. He was released in 1878 and died in 1879.

Long, Crawford W. (1815-78), American physician, was born in Danielsville, Ga. Long was probably the first physician to use anaesthesia in surgery but he hesitated to report his observations and Morton in the meanwhile made public demonstrations and published his reports.

Long, Huey Pierce (1893-1935), U. S. Senator and advocate of a national share-the-wealth movement, was shot by an assassin on September 8, 1935, his death occurring two days later. Born at Winnfield, Louisiana, Long became a traveling salesman, then a lawyer and opened his political career by fighting the Standard Oil Company as a state railroad commissioner. He became Governor of Louisiana in 1928 and U. S. Senator in 1931. Long tightened his hold on the administrative machinery of Louisiana through a succession of special Legislatures until his political foes said he had established a dictatorship. Although he had helped to nominate Franklin D. Roosevelt for the Presidency in 1932, the self-styled "Kingfish" later fought Roosevelt bitterly, at the same time pressing his share-the-wealth program as the springboard for his own intended Presidential campaign in 1936. His assassin was Carl A. Weiss, an eye and ear specialist whose father-in-law, a judge, faced the loss of his place through Long's special laws.

Long, John Davis (1838-1915), American

public official, was born in Buckfield, Me. In 1879 he became lieutenant-governor of Massachusetts, and in 1880-82 was governor. From 1883 to 1889 he was a representative in Congress. He became secretary of the navy under McKinley in 1897, and the success of the naval forces during the Spanish War was due in large part to his untiring efforts.

Long, John Luther (1861-1927), American author and playwright, born in Pennsylvania, was admitted to the bar, and practiced law in Philadelphia. He is best known as the author of *Madam Butterfly* (1898) upon which the opera of the same name is based.

the species, though the reason for the limit it not quite understood. It has probably something to do with size, for generally speaking, small animals are shorter lived than large ones; but this is only approximately true, for queen ants are long-lived. Again, the length of life has something to do with the rate at which maturity is reached: man and the elephant alike come slowly to maturity, and are long-lived.

Longfellow, Henry Wadsworth (1807-82), American poet, was born at Portland, Me., on Feb. 27, 1807. He graduated from Bowdoin College in 1825. He sailed for



Photo from Ewing Galloway, N. Y.

Buckingham Palace.

Long Beach, city, California, Los Angeles co., on the Los Angeles-Long Beach twin harbor. There are fine parks, and many points of scenic interest near by including the Catalina Islands. Recently developed oil-fields on the outskirts of the city are the source of a thriving industry. Long Beach has, moreover, a trade in lumber, fruits, and farm produce; p. 164,271.

Long Branch, city, New Jersey, in Monmouth co., on the Atlantic Ocean, 46 m. s. of New York City. It is noted as a fashionable resort and was settled about 1667; p. 17,408.

Longchamps, pleasure resort in the Bois de Boulogne, west of Paris, over whose famous course in June is run the race for the Grand Prix.

Longevity, duration of life. In the case of perennial plants, if the food-supply continue sufficient, there seems no reason why life should not be prolonged, unless through accident, almost indefinitely. The same is apparently true of many sluggish and sedentary animals. With most active and highly differentiated animals, however, the length of life is more or less definitely determined for

Europe in 1826, and during the next three years made a study of European languages, visiting France, Spain, Italy, and Germany. He entered upon his duties at Bowdoin in the autumn of 1829, and proved eminently successful as a teacher. Longfellow published a translation of *Las Coplas* of Don Jorge Manrique (1833), and in the same year he issued a portion of *Outre Mer*, a fruit of his European travel, the second part of which appeared in 1835. A year later he succeeded George Ticknor, later the historian of Spanish literature, as professor of modern languages at Harvard. *Hyperion* (1839), a poetical romance which enjoyed immense popularity, reflects the combined influence of Richter and German romanticism on the poet. The heroine of the story, Frances Elizabeth Appleton, became his wife in 1843. Longfellow's career at Harvard began in 1836, and continued for seventeen years. At his house in Cambridge, for a time the residence of Washington, he gathered around him a large circle of friends, including Agassiz, Hawthorne, Holmes, Lowell, Emerson, Felton and Sumner. *Voices of the Night* (1839) and *Ballads and other Poems* (1841) awakened the world

to the fact that a new poetical force had arisen in literature. Two years later a drama, without any special merit, *The Spanish Student*, enjoyed an almost equal popularity. Longfellow paid a third visit to Europe in 1842, and on his return home he published his *Poems on Slavery*. *The Poets and Poetry of Europe* (prepared in conjunction with Professor Felton), *The Belfry of Bruges*, *The Waif*, and *The Estray*, written between 1845 and 1846, widened the poet's fame. These

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Photo from Brown Bros.

The Old Curiosity Shop.

were followed by *Evangeline* (1847), the best of his longer poems, written in dactylic hexameters. *Kavanaugh* (1849) proved a failure; but *The Seaside* and *The Fireside* (1850), a volume of minor poems written in a most engaging form, was more successful; and equally so was *The Golden Legend* (1851—a romance of the middle ages. Longfellow resigned his chair at Harvard (1854) in order to devote himself more freely to purely literary work. *Hiawatha* (1855), an Indian legend, the outcome of his new and welcome leisure, was written in the trochaic tetrameter measure of the Finnish epic *Kalevala*. A collection of minor poems, *Birds of Passage*, appeared simultaneously with *Miles Standish* in 1858. His charming *Tales of a Wayside*

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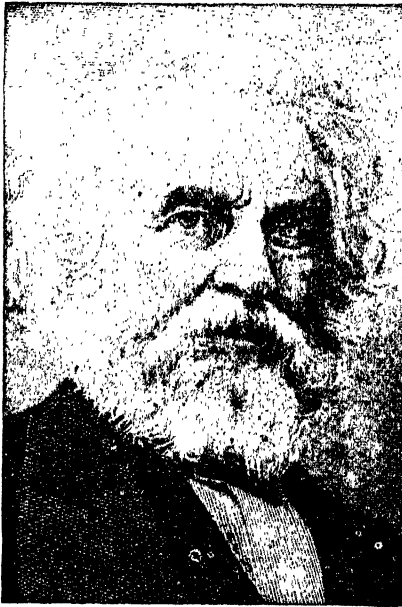
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his works are *Cyclopædia of Architecture in Italy, Greece, and the Levant* (1895), and *The Column and the Arch, Architectural Essays* (1899), besides many contributions to periodicals.

Longford. (1.) Inland co., Leinster, Ireland. It has extensive tracts of bog; on the Leitrim border are bare hills, and in the center and s. good grazing land. Pasturing and agriculture are principal industries. Area 421 sq. m.; p. 43,794. (2.) Town, cap. of above county. It is an agricultural center, and has military barracks. The seat of the



Henry Wadsworth Longfellow.

Roman Catholic bishop of Ardagh and Clonmacnoise. Its cathedral is a fine structure of the Ionic order; p. 3,747.

Longinus, Dionysius Cassius (c. 213-c. 273 A.D.), a famous Greek rhetorician, whose place of birth was most likely Athens. Late in life he went to Emesa in Syria, where he met Zenobia, queen of Palmyra, who induced him to become her teacher of Greek literature. After the death of her husband he was her chief adviser, and counselled her to throw off her allegiance to Rome, the result of which was that (273 A.D.) the Emperor Aurelian captured and destroyed Palmyra and executed Longinus. The great work *De Sublimitate*—the finest example of ancient

literary criticism—attributed to him, is probably of earlier date. See ed. by Rhys Roberts (1899); Saintsbury's *Hist. of Criticism* (1900-4).

Long Island, a long, narrow isl. in the Atlantic Ocean, extending e. from the mouth of the Hudson River along the coast of New York and Connecticut. Area, 1,680 sq. m. It is about 120 m. long and from 12 to 20 m. wide. A strait $\frac{1}{2}$ m. wide known as the East river, separates it from Manhattan, and below upper New York Bay the Narrows separate it from Staten Island. Between it and Connecticut and New York is Long Island Sound. The e. end is divided by Peconic Bay, which runs in 30 m. Orient Point is at the n. entrance and Montauk Point, 20 m. farther e., is at the s. A large part of the island is under cultivation and market gardening is extensively carried on; p. 4,103,638.

Long Island, Battle of, a battle fought on Brooklyn Heights, Long Island, on Aug. 27, 1776, during the American Revolution, between the Americans under the immediate command of Gen. Israel Putnam, and the English under Lord William Howe. The Americans were defeated.

Long Island City, former city, now the 1st ward of the borough of Queens, New York. Large oil works are situated here. The first settlement was made by the Dutch in 1640. Long Island City was formed in 1870; p. 160,000.

Long Island Sound, an arm of the Atlantic Ocean, about 110 m. long and from 20 to 25 m. wide, separating Long Island from Westchester co., N. Y., and from the state of Connecticut.

Long Parliament, the name commonly given to the fifth and last parliament of Charles I. It met on Nov. 3, 1640, and finally dissolved itself (March 16, 1660).

Longspur, the name given to a genus (*Calcarius*) of large northern finches of Canada and the United States in reference to the characteristic hind claw, which is very long and spur-like.

Longstreet, Augustus Baldwin (1790-1870), American lawyer, educator, and author, was born in Augusta, Ga., and graduated (1813) at Yale. He founded the *Augusta Sentinel*, and was president of several Southern colleges, including the University of Mississippi. He was a frequent contributor to the periodicals, but is best remembered by his *Georgia Scenes* (1840).

Longstreet, James (1821-1904), American soldier, born in Edgefield District, S. C. Dur-

ing the Civil War in the battle of First Manassas of Bull Run, he commanded the fourth brigade under Gen. Beauregard and handled his troops well. Although he vigorously opposed Gen. Lee's plan of attack at Gettysburg and did not attack until 4 o'clock on the second day nothing was lost by the delay. He preserved the confidence of Gen. Lee, who called him his 'old war horse,' to the end of the war. Gen. Longstreet was tenacious of his opinions, outspoken in his likes and dislikes, a hard fighter and a good hater. At the end of the war he removed to New Orleans to engage in the cotton business, became a Republican in politics and accepted from President Grant, whom he had known at West Point, the office of Surveyor of Customs at New Orleans. He published a history of his campaigns, *Manassas to Appomattox* (1896), and since his death his wife has published an elaborate defense of his course at Gettysburg, entitled *Lee and Longstreet at High Tide* (1904).

Longworth, Nicholas (1869-1931), American congressman, was born in Cincinnati, of a wealthy family, graduated (1891) at Harvard, and at the Law School there in 1894, and was admitted to the Cincinnati bar the same year. He married Alice, daughter of President Theodore Roosevelt, at the White House, Washington, on Feb. 17, 1906. He became Speaker of the House in 1925, after serving as Republican floor leader 1923-4.

Lonicera. A genus of shrubs, generally called honeysuckle, and belonging to the Caprifoliaceæ. They are usually hardy; some are upright bushes, while others twine.

Lons-le-Saunier, tn., cap. of dep. Jura, France, near source of riv. Solman. Near it is Montmorot, famous for its brine springs.

Loo-choo or Lu-chu Islands (Jap. *Riu-kiu*), contain 36 principal islands, extending in a n.e. to s.w. direction from the Gulf of Kagoshima, in S. Japan, to Formosa.

Loofah. The fibrous interior of gourds of the genus *Luffa*. It is known as vegetable sponge-dish-rag, snake gourd, etc.

Lookout Mountain, a ridge running n.n.e. and s.s.w. from the vicinity of Chattanooga, Tenn. The highest point (2,126 ft.), $2\frac{1}{2}$ m. from Chattanooga, the scene of the famous battle of the Civil War.

Looming, the name applied by nautical men when distant objects appear abnormally elevated above their true positions.

Loomis, Alfred Libbeus (1831-95), American physician, born at Bennington, Vt. He was appointed assistant physician to the char-

ity hospitals on Ward's and Blackwell's islands. New York city, and visiting physician to Bellevue Hospital, New York, in 1860, and retained the position until his death. He was associated with, and induced a friend to establish a medical department in New York University, which, under the name of the Loomis Laboratory, has become famous throughout America.

Loomis, Francis B. (1861), American journalist and diplomatist, born in Marietta, O., and graduated from Marietta College in 1883. From 1901 to 1903 he was envoy and minister to Portugal, when he was appointed Assistant-Secretary of State. President Roosevelt sent him to Paris in July as special ambassador to the public ceremonies incident to the removal of Paul Jones's body. He resigned in September, 1905. He was made an officer of the Legion of Honor by the French government in 1904.

Loomis, Silas Laurence (1822-96), American scientist, born at Coventry, Conn. His most important discoveries were a process of dyeing textiles with an extract of palmetto, and a process of reducing chromium ore to metallic chromium.

Loón, pueb., Bohol, Philippines, on w. coast of the isl., $12\frac{1}{2}$ m. n. of Tagbilaran.

Loon, or **Loom**, the name usually given in North America to the great northern diver.

Lope, Felix de Vega Carpio ((1562-1635), Spanish dramatist, born in Madrid, and educated at the Jesuit College there. His first known play, *El verdadero amante*, was written when he was twelve years old. In 1598 followed a pastoral prose narrative, *Arcadia*, and the famous epic poem on Sir Francis Drake, *Dragontea*. For a number of years after this, Lope devoted himself to the composition of sacred poems, such as *Soliloquios* and *Los Pastores de Belen* (1612). In drama alone he wrote 1,800 separate plays and 400 autos (religious pieces), of which 400 plays and 40 autos survive. A large number of the dramas are to be found in the series *Autores Españoles* by Hartzenbusch (1846-80). A complete edition of Lope's works was begun by the Spanish Academy in 1890; the fifteenth volume was in course of preparation when Menéndez y Pelayo, the editor, died.

Lopez, Narciso (c. 1798-1851), South American adventurer, was born in Caracas, Venezuela. In 1848 he took refuge in the United States, where he planned three filibustering expeditions to Cuba.

Lorain, city, Ohio, Lorain co., on Lake Erie. The town, beautifully situated on the

shore, with a deep inland harbor. Industries include shipbuilding, railroad shops, and the manufacture of iron pipe, steel rails. An important shipping trade is carried on in coal, grain, lumber, and iron ore; p. 44, 125.

Loranthaceæ, an order of parasitic evergreen shrubs.

Lord, a title applied in Great Britain to persons of noble birth and those enabled by patent, and also, as an honorary title to certain official persons, used either in addressing them or as part of their designation.

Lord, Chester Sanders (1850-1933), American journalist, was born in Romulus, N. Y. In 1872 he became a member of the staff of the N. Y. *Sun*, and a few years later managing editor, a position which he held until 1913.

credited. Thereafter he was besieged by thousands of cripples, many of whom he was said to have cured. After the World War he organized a fund for relief of undernourished Austrian children, and in recognition of large American contributions he visited this country often, giving his services without charge.

Loreto, department of Northeastern Peru, with Ecuador on the n. and Brazil and Bolivia on the e. Area, 288,456 sq. m.; p. 100,600.

Lorimer, George Horace (1868-1937), American author and editor, was born in Louisville, Ky. In 1898 he joined the staff of *The Saturday Evening Post*, of which he became editor-in-chief in 1899. After the death of Curtis in 1933 he became president of the Curtis Publishing Co.



Lookout Mountain from the Tennessee River.

(Copyright 1902 by Detroit Photographic Co.)

Lord Howe Island, an island in the South Pacific, between Port Jackson and Norfolk Island; 436 m. n.e. of Sydney.

Lorelei, or **Lurlei**, a famous rock on the right bank of the Rhine, near St. Goar, noted for the danger it offered to navigation and for a marvellous echo.

Lorentz, Hendrik Antoon (1853-1928), Dutch physicist, was born in Arnheim. In 1902, with his pupil Zeeman, he received the Nobel prize in physics.

Lorenz, Dr. Adolph (1854-). He won world acclaim as an exponent of "bloodless surgery," or external manipulation in the treatment of orthopedic diseases, particularly in children. Born in Silesia, he came to the United States in 1910 to attend Miss Lolita Armour, daughter of the Chicago packer, for whose recovery from a hip disease he was

Lorimer, William (1861-1934), American legislator, was born in Manchester, England. He came to the United States with his parents in 1866. In 1895 he was elected to the U. S. House of Representatives, where he served continuously, with the exception of one term, until 1909. In the latter year he became U. S. Senator from Illinois. Charges of corrupt practices having been made against his campaign managers, a committee was appointed by the U. S. Senate to investigate those charges. On March 1, 1911, the Senate, voting on the committee's report, declared his election valid; but new evidence having been adduced, another investigation was ordered, and on July 13, 1912, by a vote of 55 to 28, the Senate decided that his seat was vacant.

Lorraine, or **Lotharingia**, an ancient kingdom and a province of France in the 18th

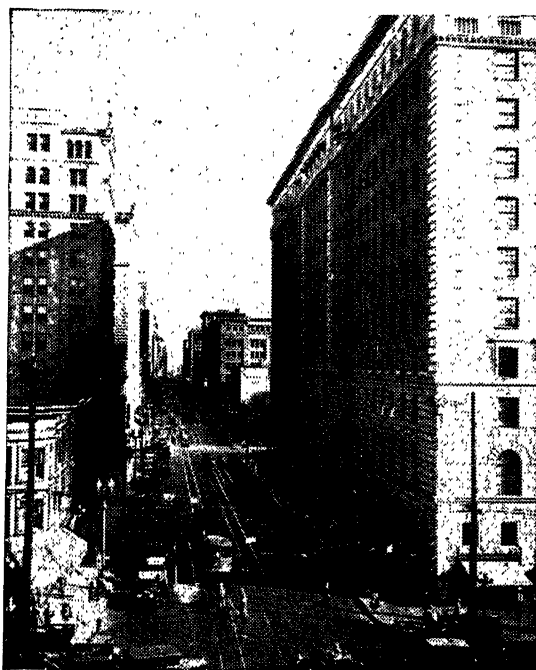
century. It was included in Charlemagne's empire. In 1871, at the close of the Franco-German War, Northeastern Lorraine was ceded to Germany. By the treaty of Versailles (1919), ending the World War, it was restored to France; retaken by Germany, 1940.

Los Angeles, city, California, county seat of Los Angeles co., largest city w. of the Mississippi River, and the fifth in population in the United States, is situated on the Pacific Coast, 140 m. n.w. of the Mexican boundary.

Los Angeles covers an area of 442 sq. m., the largest of any city in the country, stretch-

publishing, and since 1928, airplane manufacture. The soil of the districts in the northern and western parts is rich in petroleum, and the mining interests of Southern California have their center in Los Angeles.

Hollywood is the center of America's motion-picture production industry, nearly all the large producers having studios here or immediately nearby. With respect to ocean tonnage the port is the most important on the Pacific coast of the United States, and it is an important port in intercoastal traffic. Its activity was furthered by the opening of the



Los Angeles: Looking up 7th Street.

ing from the mountains to the ocean. Educational institutions include the University of Southern California, the University of California at Los Angeles, Occidental College, Loyola University, several business colleges. The growth of importance of the city's manufacturing industries has been as remarkably rapid as that of its population. Los Angeles ranks high among American cities for its manufactures, which are rapidly growing. The chief industries are motion picture production, oil refining, machinery, building materials, furniture, meat packing, rubber tires, clothing, chemicals, cements, and paints, printing and

Panama Canal in 1914. Under Mexican rule Los Angeles alternated with Monterey as the capital of California. In 1847 it passed permanently under the control of the United States. In the heart of California's sunshine zone, Los Angeles is popular as a health and pleasure resort. Many national organizations hold their conventions here. Hollywood annually attracts thousands of visitors who are welcomed at many of the studios and is a mecca for playwrights of the world; p. 1, 504, 277.

Lossing, Benson John (1813-91), American author, was born in Beekman, N. Y. He

was successively farm boy, watchmaker, journalist, wood engraver, artist, and historian. His chief works, illustrated by himself, *History of New York City* (1884); *The Empire State* (1887).

Lost Property. In law, property is considered lost only when the owner has involuntarily and accidentally parted with its possession. Where a person finds property and knows the true owner, or could discover him with reasonable diligence, but keeps it, intending to convert it to his own use, he is guilty of larceny in most jurisdictions. In some of the United States, however, if the finder does not know who is the owner, and there is no name or other means of discovering him on the property, he need not go to any trouble to find the owner. A finder is bound to take some care of lost property, and must not wantonly allow it to be destroyed. In most States a finder is entitled to recover any expenses he may have incurred in the preservation of the property.

Lost Tribes, The. It is a well-authenticated fact that a considerable proportion of the inhabitants of North Palestine were carried into captivity during the closing years of the kingdom of Israel. Many inquirers have busied themselves with speculations as to what became of the expatriated people—e. g., they have been found in the North American Indians, the inhabitants of Great Britain and the United States, the Anglo-Celtic peoples, and the Japanese. The natural assumption is that they were absorbed by the peoples among whom they were settled.

Lot, department, Southwestern France. Tobacco, hemp, and fruits are grown. About six per cent. of the department is under vineyards, and large quantities of wine are produced. Industries include flax spinning, tanning, and the manufacture of coarse cloths. Area, 2,018 square miles.

Lot, a character of Hebrew patriarchal times. Being forewarned of the imminent destruction of Sodom, he escaped with his family—his wife, however, being turned into a pillar of salt as the penalty for looking back.

Lot-et-Garonne, department, Southwestern France. The soil is fertile and highly cultivated; grapes, wheat, maize, barley, potatoes, tobacco, hemp, plums, and apricots are grown. Iron deposits are plentiful. Area, 2,078 square miles.

Lothaire I. (795-855), emperor of the Holy Roman empire, eldest son of Louis the Pious, on whose death (840) he claimed the title.

Lothaire II., The Saxon (1075-1137), em-

peror of the Holy Roman empire, became duke of Saxony through his wife, and king of Germany by election.

Lothians, The, district of Scotland, includes the counties of Haddington, Edinburgh, and Linlithgow, named respectively East, Mid, and West Lothian.

Lothrop, Harriett Mulford (Stone) (1844-1924), American author, born in New Haven, Conn. Under the pen name of MARGARET SIDNEY she became a successful writer of books for young people, especially the 'Pepper' series, beginning with *Five Little Peppers and How They Grew* (1882), which was succeeded by ten other 'Pepper' books.

Loti, Pierre, pseudonym of **Louis Marie Julien Viaud** (1850-1923), French novelist, born in Rochefort. He was a novelist of the sensations, a pure emotionalist, and perhaps the greatest impressionistic writer of his time. His roving spirit was attracted to the navy, and his wanderings while in the service resulted in wonderful word pictures of the East, full of color, sketched in a spirit of gentle melancholy. Among his books are: *Le Pêcheur d'Islande* (1886), the most popular of his books; *La Fille du Ciel*, drama (with Judith Gautier, 1911), translated (*The Daughter of Heaven*) by R. H. Davis (1912), and produced in New York City.

Lotions, aqueous solutions of medicinal substances for external use, and for antiseptic, stimulating, astringent, and other purposes.

Lotophagi, or Lotus-eaters, in ancient Greek legend, a people met with by Odysseus in his wanderings. They ate the fruit and drank the juice of a plant which had the property of causing a man to lose all desire to return to his own land.

Lots, Casting, a mode of divination practised by many ancient peoples. It was used extensively among the Hebrews, though we do not know the means employed.

Lötschberg Tunnel, a trans-alpine railway tunnel extending from Kandersteg, in the Bernese Oberland, to Goppenstein; 17½ m. from Brigue. Its length is slightly over 9¼ m., and it ranks third among the great Alpine tunnels.

Lottery. A lottery, or 'a distribution of prizes by lot or chance,' although, like other games of chance, permitted by the common law, has been declared illegal by statute in most of the United States, and in Alaska, Porto Rico, Hawaii, England, Belgium, France, Holland, and Switzerland. Under the United States statutes, in order to constitute a lottery the distribution of prizes must de-

pend solely on chance. If there is an element of skill inherent in the transaction, it is not a lottery. Most of the States have statutes prohibiting lotteries and other forms of gaming; and the Federal laws prohibit the sending of certain mail matter, such as tickets and advertisements.

Lotus, the common name of many different plants of both ancient and modern times. The sacred lotus of Egypt was the water lily, *Nymphaea Lotus*. The yellow lotus of the Middle and Southern United States is similar, with floating leaves and cream-colored blossoms.

Lotze, Rudolf Hermann (1817-81), whose name is perhaps the most important in philosophy since Hegel, was born in Bautzen, Saxony. On the subjects to which his studies were mainly devoted—medicine or biology and philosophy—he wrote largely. In philosophy Lotze represents a reaction against the speculative movement which culminated in Hegel. One of his favorite themes was the mechanical view of nature. A new German edition of Lotze's *System der Philosophie* was issued in 1912.

Loubet, Emile (1838-1929), French statesman, born in the village of Marsanne (department of Drôme). In 1899 he was elected president of the French republic, in succession to M. Faure. M. Fallières succeeded him in 1906. Several events in international importance distinguished his tenure of office. He succeeded in bringing about a more friendly feeling between France and Britain than had existed for several generations.

Louis IX. (1215-70), king of France, better known as SAINT LOUIS, came to the throne in 1226. His government was wise and successful; he secured the submission of Aquitaine and Toulouse, and added Provence to France.

Louis XI. (1423-83), king of France, the eldest son of Charles VII., was born in Bourges. He raised France from the degradation of the Hundred Years' War and gave to the government the unity and vigor that the times required. In his internal administration he made great use of the new ideas of Roman law which were fast coming into vogue. He has been called the first of modern statesmen, and may be compared to his younger contemporary, Henry VII. of England.

Louis XIII. (1601-43), king of France, son of Henry IV., was born in Fontainebleau. He ascended the throne at the age of nine, and in 1615 married Anne of Austria. Richelieu became minister in 1624, and thenceforward ruled France with almost absolute sway.

Louis XIV. (1638-1715), king of France—the 'Grand Monarch'—was the son of Louis XIII. His reign saw the French monarchy reach and pass its zenith. The bureaucratic machinery of central government was rearranged, and the monarchy became more absolute than ever. Then France became involved in a long series of wars. In 1700 the War of the Spanish Succession broke out, in which Louis fought to secure the crown of Spain for his grandson. Louis obtained wonderfully favorable terms in the Peace of Utrecht (1713); but he had thrown away the internal prosperity of his country, and all share of the New World and chance of colonial empire.

Louis XV. (1710-74), king of France, the great-grandson of his predecessor, Louis XIV., was brought to the throne by a series of deaths in the royal family. Louis xv., except during a few years after his majority, was indolent, sensual, and suspicious, without any sense of duty or talent for affairs. He was ruled by his mistresses, of whom the most famous were Madame de Pompadour and Madame du Barry. Abroad, France engaged in two great wars. The War of the Austrian Success (1741-8) brought some striking successes to the French arms; but in the Seven Years' War (1756-63) which followed, France was crushingly defeated by Frederick the Great, and lost to England Both Canada and India.

Louis XVI. (1754-93), king of France, the grandson of Louis xv., was left with the legacy of Louis xv.'s misgovernment. For less than two years Turgot was allowed to work at his scheme of reforms, the adoption of which might have averted the Revolution; but he was overthrown through the opposition of the queen, Marie Antoinette. In 1778 France entered into the war between America and England, and gave invaluable assistance to the Colonies in their struggles for independence.

In October, 1789, the royal family was brought by the mob to Paris, whence they escaped in June, 1791, only to be stopped at Varennes and brought back. In September, 1791, Louis accepted a new constitution; but he was by this time hopelessly alienated from the government of the day, and was looking for foreign intervention as the only means of salvation. The king was brought to trial, found guilty of a conspiracy against the nation, and guillotined on Jan. 21, 1793. Louis was a weak, stupid, well-meaning man.

Louis XVII. (Louis Charles) (1785-95), titular king of France, was the second son of Louis xvi. He became heir-apparent to the

throne upon the death of his brother in 1789, but never reigned. He was imprisoned in the Temple (1792), where he is thought to have died.

Louis XVIII. (1755-1824), king of France, brother of Louis XVI. He played an obscure part during the latter's reign. On the outbreak of the Revolution he managed to reach Brussels, and passed the years down to 1814 in exile. In 1807, after the Treaty of Tilsit, he took refuge in England; and in 1814, when Napoleon was sent to Elba, he was proclaimed king, and entered Paris. His reactionary measures did much to prepare the way for Napoleon's ill-fated attempt of 1815. He was restored to the throne after Waterloo, and played an exceedingly difficult part with considerable ability.

Louis Alexander of Battenberg, Prince (1854-1921), British naval officer, eldest son of Prince Alexander of Hesse, born in Gratz, Austria. He was naturalized a British subject, and entered the Royal Navy as a cadet in 1868. In 1884 he was married to Princess Victoria, daughter of the Grand Duke of Hesse and of Princess Alice, sister of Edward VII. At the request of King George he adopted the name of Mountbatten, and was created Marquess of Milford Haven (1917).

Louisburg, town, Atlantic coast, Cape Breton Island, Canada. It commands the entrance to the Gulf of St. Lawrence. In 1745 Louisburg was captured by a force from New England under Col. William Pepperell, but it was restored to France three years later by the Treaty of Aix-la-Chapelle.

Louisiade Archipelago, group of islands, Oceania, at the southeastern extremity of Papua (British New Guinea). The inhabitants are of Papuan and Malayan type.

Louisiana (named for Louis XIV. of France), one of the Southern States. The total area is 48,506 sq. m., of which 3,097 are water surface. The coast line is about 1,500 miles.

TOPOGRAPHY.—The surface of the State is generally level. Starting with elevations of about 400 ft. near the Arkansas line, there is a gradual slope toward the s.e. In the southern part, prairie areas are common, and these merge into the wooded swamps and marshes of the sea coast. The principal river is the Mississippi, which flows for nearly 600 m. through the State.

There are also numerous sluggish water courses, or river outlets, called 'bayous'—the best known being Bayous Teche, Plaquemine, Atchafalaya, Lafourche, and Bœuf. These bayous are of service in disposing of surplus

water at flood times, and many are navigable. The climate is mild, almost tropical, and not subject to violent changes. The soils are characterized by unusual fertility, especially the calcareous marls and disintegrated limestones of the prairie region and the extensive alluvial deposits of the broad river bottoms. The soils of the n.e. are red sandy clays of good quality. The alluvial soil comprises an area aggregating over 13,000 sq. m. The principal mineral products in order of value are petroleum, natural gas, sulphur and salt. Louisiana ranked fourth among the States in 1937 in petroleum output. Louisiana is a leading State in the production of native sulphur, from the great deposits in Calcasieu Parish. Louisiana ranked high among the States in 1937 in salt output from rock salt. Swamp cypress and liveoak are important timber trees. Among the numerous other varieties may be mentioned oak, cedar, willow, locust, cottonwood, hickory, black walnut, magnolia, sweet gum and ash. The most important fishery products are oysters, shrimps, squeteagues, redfish and croaker. With a fertile soil, a tropical sun, and well-distributed and abundant rainfall, Louisiana is well adapted to agriculture. Cane sugar, rice, corn and strawberries are the chief agricultural products. The plantation system which prevailed before 1860 has been gradually supplanted by smaller farms. Orchard fruits are also produced in Louisiana.

Although Louisiana is not essentially a manufacturing State, from 1849 to 1909 the value of its manufactures increased at a greater rate than the value of the manufactures of the United States as a whole. A large proportion of the raw materials used in the manufactures of Louisiana is furnished by its forests, and by its sugar cane, cotton and rice fields. The rapid development of the oil fields of the South, particularly in Texas, has afforded a cheap substitute for coal, and given an increased impetus to manufactures. New Orleans ranks seventh among the United States ports in net register tons of shipping, and ranks fourth in number of vessels; population, 2,363,880.

The early explorers of Louisiana were the Spaniards under the leadership of Pineda in 1519 Narvaez in 1529, and De Sota in 1541. In 1682 La Salle, having sailed down the Mississippi River, took possession of the territory in the name of the king of France, Louis XIV. In 1762 France ceded the region w. of the Mississippi and the city of New Orleans to Spain. In 1803 the territory of Louisiana was purchased by the United States from Napoleon



Photo from Ewing Galloway, N. Y.

Louisiana: The cane harvest.

r. of France, who had acquired it from Spain by a secret treaty in 1800. In 1804 the region comprised in the present State of Louisiana w. of the Mississippi was organized as the Territory of Orleans; and on April 30, 1812, the Territory of Orleans, increased by the region e. of the Mississippi River, was admitted as a State under the name of Louisiana. In the War of 1812 New Orleans was the scene of important military operations.

The Reconstruction period witnessed serious race riots in New Orleans, and the terrorization of negroes and Republicans throughout the State. With the enfranchisement of the negroes by the constitution of 1868 and the ratification of the Fourteenth Amendment, military occupation ceased. Then followed election contests, with rival governments supported by State or Federal troops, until in 1876 President Hayes refused further Federal intervention in politics. About this time the construction of huge levees and of jetties along the Mississippi was begun by the Federal Government. In 1890 the Louisiana Lottery Company sought a renewal of its charter, but was unsuccessful; and in 1898 lotteries were made illegal in the State. In the spring of 1927, the most disastrous floods in the history of the State occurred. The Federal Government appropriated \$325,000,000 for flood control, which it was hoped would prevent a recurrence of such suffering. In 1928 New Orleans became the terminus of an air mail route from New York. In 1929 Governor Long was tried by a court of impeachment on 19 charges but was not convicted.

In the winter of 1933 the Louisiana banks were among the first to be affected, and a legal holiday was declared early in February. As a result of the bank trouble all salaries and many payments were held up. In late 1932 there was agitation by the Anti-Long party for a recount of votes in the November voting concerning constitutional amendments. Although two grand-jury inquiries were started, nothing resulted because Governor Allen, a partisan of Long, declared martial law in August, 1933 and the recount was dropped.

Going from the Governor's chair to the U. S. Senate, Huey Long tightened his control of the state's affairs. In 1934, he virtually became dictator of the state when the Legislature greatly increased the authority of Governor Allen. In 1939, Louisiana was rocked by scandal and charges of graft in high official places, and notable was the resignation of Governor Locke. It was the Federal Government which intervened to expose and prose-

cute the corruption. More than 30 of the state's highest officials were indicted and Dr. James Monroe Smith, former president of Louisiana State Univ., was sentenced to prison for using the mails to defraud the state.

Louisiana, city, Pike co., Missouri, on the Mississippi River. It has some manufactures and one of the largest nurseries in the United States, which has taken over the larger part of Luther Burbank's farms and experiments; p. 4,669.

Louisiana Lottery, a lottery chartered in 1868 in Louisiana for a period of 25 years, holding a monopoly of the business in the State, in return for which it paid into the State treasury \$40,000 a year.

Louisiana Purchase, the territory purchased by the United States from France in 1803. The 'Louisiana' thus purchased was about 1,000,000 sq. m. in area, and included what is now Louisiana, Arkansas, Missouri, Iowa, Minnesota w. of the Mississippi, North Dakota, South Dakota, Nebraska, nearly the whole of Kansas, the portions of Montana, Wyoming, and Colorado e. of the Rocky Mountains, and most of Oklahoma. For this territory the United States paid, directly and indirectly, \$15,000,000, not including interest payments. President Jefferson was eager to secure it primarily for the purpose of giving the United States absolute freedom in the navigation of the Mississippi River.

Louisiana Purchase Exposition, an international fair held in St. Louis, Mo., from April 30, to Dec. 1, 1904, for the purpose of celebrating the centenary anniversary of the purchase of Louisiana Territory by the United States from France.

Louisiana State University and Agricultural and Mechanical College, a coeducational State institution at Baton Rouge, La. It was founded in 1855 as the Louisiana State Seminary of Learning and Military Academy, and was opened in 1860, near Alexandria, with Col. W. T. Sherman as superintendent. After the burning of the college building, in 1869, it was removed to Baton Rouge, and in 1870 the name was changed to Louisiana State University. The Agricultural College was merged with the University in 1877.

Louis Philippe, (1773-1850), king of the French, the son of Philippe 'Egalité,' who was executed during the Revolution (1793), was born in the Palais Royal, Paris. In 1793 he left the army and went to England, and from 1796 to 1800 lived in the United States. He returned to France in 1814, and under Louis

xviii. and Charles x. was regarded as the leader of the Liberal Party. Upon the abdication of Charles x., in 1830, he was made lieutenant-general of the kingdom, and a week later the two Chambers declared him 'king of the French.' In 1836 Louis Napoleon tried to stir up a rising among the troops at Strassburg, but failed, and was sent to America, whence he made his way to England. In 1840 he landed at Boulogne, and made an unsuccessful attempt to organize an insurrection; on his capture he was condemned to imprisonment for life. In 1848 the king abdicated and fled, though he had the support of the army. He was deposed by the Assembly and exiled. He spent the remainder of his life in England.

Louisville, city, Kentucky, county seat of Jefferson co., and the largest city of the State. The city is 110 m. s.w. of Cincinnati. It is built on a level plain, and is about 60 ft. above low-water mark and 525 ft. above sea level. The Ohio River at low water here falls 26 ft. in 2 m. A canal connects the river above and below the falls; but during high water boats pass directly over the falls. There is steamship connection with Cincinnati, Evansville, and other ports on the Ohio and the Mississippi. Bridges connect the city with New Albany and Jefferson, Ind.

Louisville is one of the principal gateways to the Southwest, and the chief market of the Lower Ohio. It is noted as a leaf tobacco market and has an important trade in manufactured tobacco, as well as livestock. Louisville is the leading manufacturing city of the State.

Railroads entering Louisville include: L. & N., B. & O., Pennsylvania, I.C., L.H. & St.L., C.I. & L., C.C.C. & S.L., Southern and C. & O. Industries include: Agricultural implements, motor vehicle bodies, iron and steel, food products, chemicals, tobacco products, textiles, lumber and packing plants; hydro-electric plant; railroad shops, printing, publishing and engraving plants, canning and preserving factories and stove works.

The city is the seat of the University of Louisville, the Southern Baptist Theological Seminary, the Presbyterian Theological Seminary, the Kentucky School for the Blind.

Louisville is the scene each spring of the classic American horse racing event, the Kentucky Derby, which attracts tens of thousands of race enthusiasts to the Churchill Downs track; p. 319,077.

Louisville was laid out in 1779. The first inhabitants were about twenty families that started out with the expedition of George Rogers Clark, and were left behind with sup-

plies on an island opposite the site of the city. The place was named in honor of Louis xvi., king of France. It was incorporated in 1780. During the Civil War Louisville was Unionist in sympathy. Louisville suffered severely from the Ohio River flood of January, 1937.

Lounsbury, Thomas Raynesford (1838-1915), American scholar, was born in Ovid, N. Y. In 1871 he became professor of English literature in the Yale Sheffield Scientific School, retiring in 1906.

Lourdes, town, department Hautes-Pyrénées, France, on the Gave de Pau; 22 m. s.e. of Pau. It is one of the chief places of Catholic pilgrimage. Its fame dates from 1858, when the Virgin Mary is reported to have appeared to a girl of thirteen, Bernadette Soubirous. The famous spring rising from the spot is credited with miraculous powers, and a church was built in 1889 for the accommodation of pilgrims.

Lourenço Marques, town, Portuguese East Africa, capital of the district of the same name, is situated at the mouth of the Espírito Santo or English River, in the northwestern part of Delagoa Bay.

Lousewort, a popular name for plants of the genus *Pedicularis*, particularly *P. canadensis* of the Southern United States and Canada (also called wood betony), and *P. sylvatica* of England.

Louth, maritime co., Leinster, the smallest in Ireland, lying between Carlingford Lough and the mouth of the Boyne.

Louvain, town, Brabant province, Belgium, on the Dyle River, 18 m. n.e. of Brussels. It is famous especially for its university, for its Gothic town hall, one of the finest on the Continent (1447-63), and for several interesting mediæval churches, especially St. Pierre and St. Gertrude. There are ruins of a mediæval stronghold on Mont César.

In the early days of the Great War Louvain was occupied (Aug. 19, 1914) by the Germans, and on Aug. 26 an order was given for the burning of the town on the charge (never proved) that the citizens had intended to attack the invading army. The university with its great library was destroyed and the church of St. Pierre was gutted by the flames; p. 39,147.

Louvain, Catholic University of, an institution founded at Louvain, Belgium, in 1226. Louvain was one of the famous universities of the Middle Ages, attended at one time by 6,000 students. It passed into the hands of the Roman Catholic Church in 1835. In 1914 the Germans, having occupied

the city, destroyed the university and its splendid library with its rich collections of manuscripts and rare books. On July 28, 1921, the cornerstone of a new library, planned as a gift of the American people to the people of Belgium, was laid.

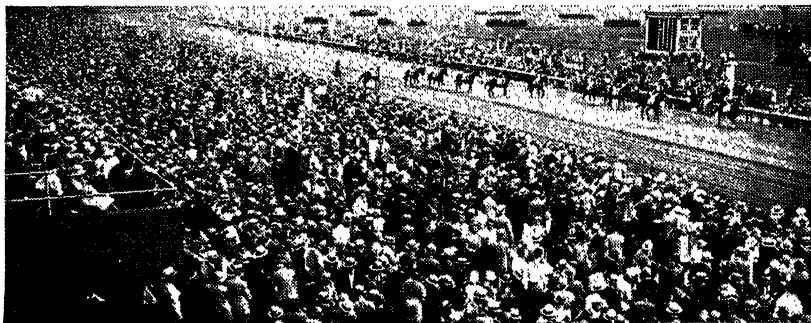
Louvre, an ornamental outlet for smoke on the roof of a building. Louvres are now generally used for ventilation.

Louvre, The, a magnificent pile of buildings facing the Seine in Paris; formerly a royal palace, now a museum of art treasures, has been known under its present name since the time of Philippe-Auguste (1204). In 1900 two new galleries were added, and it is now the most extensive museum in Europe, containing the richest collection of pictures,

poet and Cavalier, was born in Bethersden. In 1646 while fighting for France against Spain, he was wounded at Dunkirk. On his return he was imprisoned at Aldersgate, and occupied his captivity with preparing his poems for the press.

Love-lies-bleeding, a popular name for the flowering plant *Amaranthus caudatus*.

Lovell, James (1737-1814), American patriot, was born in Boston, Mass. He was graduated from Harvard University in 1756 and assisted his father in his celebrated school. He sat in the Continental Congress from December, 1776, to 1782. He was receiver of taxes at Boston in 1784-8, collector of the port for nearly two years, and naval officer until his death.



Scene at the Kentucky Derby, Louisville.

statues, antiquities, gems, and other objects of art in the world.

Love. The emotion enters into various states, either as an element or as the substance—parental love, fraternal love, the love of the sexes, benevolence, pity, gratitude, sorrow, admiration, esteem, æsthetic emotion, religious emotion, and many varieties of these. Tender emotion may extend to the animal world, and in a strict sense may have significance for the inanimate, as in the love of particular places, countries, homes, etc. Love in its most characteristic forms is the concentration of tender feeling on a person and in the love of the sexes.

Love-bird, a name applied to various small parrots remarkable for the great affection which appears to exist between the male and female.

Love-in-a-mist, or **Fennel Flower**, a hardy annual plant belonging to the genus *Nigella* of the Ranunculaceæ, native to the s. of Europe.

Lovelace, Richard (1618-58), English

Lovell, John (1710-78), American educator, was born in Boston, Mass., and was graduated (1728) from Harvard College. He was assistant master of the Boston Latin School from 1729 to 1738, when he succeeded Dr. Nathaniel Williams as head master, a position he held until the school was closed by the siege of Boston, in 1775. He was noted as a scholar and, though a stern disciplinarian, had a witty and genial manner.

Lovell, Mansfield (1822-84), American soldier, was born in Washington, D. C. he resigned from the army in 1854 and engaged in commercial life until 1858, when he became superintendent of street improvements and deputy street commissioner of New York City. He was later assistant engineer in the work of removing the obstructions at Hell Gate, in the East River.

Lover, Samuel (1797-1868), Irish novelist, ballad-writer, and painter, was born and educated in Dublin. He early devoted himself to painting, becoming (1828) a member of the Royal Hibernian Academy, and from

1835 he was a popular miniature painter in London. At the same time he made successful efforts in literature, his well known song *Rory O'Moore* being written in 1826.

Lovering, Joseph (1813-92), American mathematician, was born in Boston, Mass. He was graduated from Harvard University in 1833, in 1836 became an instructor in mathematics in that university and in 1838-89 was Hollis professor of mathematics and natural philosophy.

Lovett, Edgar Odell (1871-), American educator, was born in Shreve, Ohio. He became successively instructor, assistant professor, and professor of mathematics and professor of astronomy at Princeton. In 1908 he was made president of Rice Institute, Houston, Texas.

Lovett, Robert Morss (1870-), American educator and editor, was born in Boston, and was graduated from Harvard University in 1892. In 1919 he became editor of *The Dial*.

Low, Seth (1850-1916), American educator and civil officer, was born in Brooklyn, N. Y., and was graduated (1870) from Columbia College. He was mayor of Brooklyn (1883-6), being elected and re-elected by the reform party, and effected many reforms in the city government. In 1890 he succeeded Dr. F. A. P. Barnard as president of Columbia College, a position which he filled until 1901. His administration was marked by the transformation of the college into a university and its removal to the spacious site on Morningside Heights in New York, Seth Low himself contributing \$1,000,000 for the construction of the university's splendid library. In 1901 he was elected mayor by a fusion vote, defeating the Tammany candidate. During his term of office (1902-3), he accomplished much toward the abolition of municipal corruption in New York. In 1915 he was a delegate at large to the State Constitutional Convention.

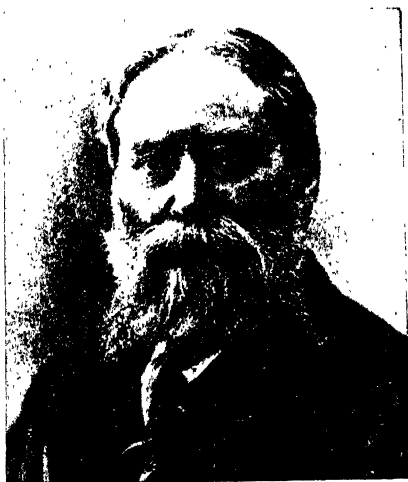
Low, Will Hicok (1853-1932), American figure painter and decorator, was born in Albany, N. Y. The fruits of his work under John LaFarge in designing stained glass (1881-2) are seen in his ten windows for St. Paul's M. E. Church in Newark, N. J., in churches in Washington, D. C., Springfield and Belmont, Mass., and in many private houses. His mural decorations for the Waldorf-Astoria Hotel (1892), for the music room in the house of the late C. T. Yerkes of New York, the Federal Building at Cleveland, the Court Houses at Newark, N. J.,

and Wilkes-Barre, Pa., and the New York State Education Building at Albany (the 36 large panels of which constitute his most notable work) are noteworthy for their fitness for their architectural setting, grace of line, and good color.

Low Archipelago, Paumotu, or Tuamotu, the most easterly group of Polynesian islands, consisting of about 80 low coral islands. The group was discovered in 1606, and was officially annexed to France in 1881.

Lowden, Frank Orren (1861-1943), American public official, was born in Sunrise City, Minn.; Governor of Illinois, 1917-21. In 1924 he refused the Republican nomination for vice president. He was a leading advocate of co-operative marketing.

Lowe, Sir Hudson (1769-1844), British general and governor of St. Helena, was born in Galway, Ireland. In 1815 he was appointed custodian of the Emperor Napoleon and governor of St. Helena, both of which duties he discharged until the death of Napoleon in 1821, when he returned to England.



James Russell Lowell.

Lowell, city, Massachusetts, county seat of Middlesex co., the sixth city of the State in population, is situated on the Merrimac River. Lowell's chief industrial importance is as a textile-manufacturing center, its great factories providing cotton and woolen piece goods of the finest quality. Other leading products are foundry and machine shop products, hosiery and knit goods, patent medicines and compounds, cartridges, and ammunition; p. 101,389.

Lowell, Abbot Lawrence (1856-1943), American publicist and educator, was born in Boston, Mass. In 1900 he was advanced to the professorship of the science of government at Harvard, and in 1908 he was appointed to succeed Charles W. Eliot as president of the University. In 1933 he became president emeritus, succeeded by James Bryant Conant. His publications include: *Governments and Parties in Continental Europe* (1896); *Public Opinion and Popular Government* (1913); *Public Opinions in War and Peace* (1923).

Lowell, Amy (1874-1925), American author, a sister of Abbot Lawrence Lowell and Percival Lowell, was born in Brookline, Mass. She is best known for her poetry, and as an exponent of free verse. Among her works are: *Pictures of the Floating World* (1919); a biography of Keats (1924); *What's O'Clock* (1925).

Lowell, Edward Jackson (1845-94), American historian, grandson of Francis Cabot Lowell, was born in Boston. Besides his contributions to periodicals, he was the author of *The Eve of the French Revolution* (1892).

Lowell, Francis Cabot (1775-1817), American merchant, son of John Lowell (1743-1802), was born in Newburyport, Mass., and was graduated (1783) from Harvard. He introduced the manufacture of cotton into America during the War of 1812, and with his brother-in-law, Patrick T. Jackson, opened cotton factories at Waltham, Mass. Their movement led to the establishment of the city of Lowell (named in his honor), which became a center of the industry.

Lowell, James Russell (1819-1891), American poet and critic, was born in the house called Elmwood, Cambridge, Mass. He was graduated from Harvard College in 1838, passed from college to the Harvard Law School, took his degree in 1840, and began practice. His interests, however, were wholly literary. He early allied himself with the anti-slavery movement, in the interests of which he wrote regularly for the *Pennsylvania Freeman* and afterwards for the *Anti-Slavery Standard*. In June of 1846 Lowell published the first of the famous *Biglow Papers* in the *Boston Courier*. The *Fable for Critics* and *Sir Launfal* were published in the same year, and Lowell's position as a poet was established. In 1857 he became first editor of the newly established *Atlantic Monthly*. In 1861 he resigned the editorship of the *Atlantic Monthly* and in 1864, with Charles Eliot

Norton, undertook the direction of the *North American Review*. The Civil War called forth Lowell's strongest sympathies: in the course of it he wrote a second series of *Biglow Papers* (published in 1867) and at the end composed the *Commemoration Ode* for the dedication of Memorial Hall, at Harvard College. In 1872 Lowell resigned the editorship of the *North American Review* and went abroad, where he was warmly welcomed. In 1877 he was named United States minister to Spain, and in 1880 was transferred to England.

Lowell, John (1743-1802), American statesman and jurist, was born in Newburyport, Mass. In 1780 he became a member of the Massachusetts constitutional convention and was instrumental in having inserted the famous clause declaring that 'All men are born free and equal,' with the view of abolishing slavery in the State. He was elected a member of the Continental Congress in 1781. In 1784 he was a member of the commission which established the boundary line between New York and Massachusetts. In 1801 he was promoted to the position of Chief Justice of the first United States Circuit Court.

Lowell, John (1799-1836), American philanthropist, son of Francis Cabot Lowell, was born in Boston, Mass. By his will, made in Egypt, he left \$250,000 as a foundation for free lectures in Boston on religion, science, and the arts. This foundation, known as the Lowell Institute, has since provided annual lectures on these subjects by distinguished specialists from all over the world.

Lowell, Josephine Shaw (1843-1905), American philanthropist, was born in West Roxbury, Mass. In 1863 she married to Charles Russell Lowell. After the death of her husband Mrs. Lowell devoted herself to charitable work. Having removed to New York City, she helped in the formation of the Charity Organization Society, and in 1876 was appointed by Governor Tilden to the State Board of Charities.

Lowell, Percival (1855-1916), American astronomer, was born in Boston; educated at Harvard. In 1894 he established the Lowell Observatory at Flagstaff, Arizona, where he spent much time in observation of the planet Mars. Among his scientific publications are *Mars and Its Canals*; *The Evolution of Worlds*; *Memoir on a Trans-Neptunian Planet*.

Lowell Institute, an institution founded in 1836 by John Lowell for the purpose of providing annual lecture courses in physics, chemistry, botany, zoology, mineralogy, liter-

ature, and other subjects, for the citizens of Boston. Lectures have been delivered by the most prominent men of letters and science in the United States and England.

Lowestoft, seaport and most easterly town in England. It is an important fishing station and a fashionable resort, near the Norfolk Broads, with excellent yachting accommodation and a bracing climate. Industries, besides fishing, include rope works and flour mills; p. 44,326.

Lowland, a term meaning in general land which does not rise more than from 600 to 1,000 ft. above the sea. Accepting the 200 meter (660 ft.) line, and excluding Antarctic lands, the area of lowlands is nearly three-tenths of the total land surface, or 15½ million sq. miles. The lowlands of the world present every variety of vegetation, according to the climate regions in which they are found, and also every phase of economic development. They are among the least-peopled, such as low-lying tundra and desert, and the most densely-populated parts of the globe. Where the climate and drainage permit, they are the most favored lands, being easy to exploit and to traverse.

Lowry, Robert (1826-99), American Baptist clergyman, was born in Philadelphia. He became professor of belles-lettres at Lewisburg University, Pa., but resigned in 1875 to accept a call from the church in Plainfield, N. J. He wrote and composed the music for several hymns and compiled the *Chapel Melodies* (1868) and the *Chataqua Carols* (1878).

Low Sunday, the Sunday after Easter; also called *Quasimodo* and *Dominica in albis depositis*, because those who had been baptized on Easter Eve then first laid aside their white robes. The name Low Sunday was given partly to contrast it with the high festival to which it succeeded, partly perhaps because, as the octave of Easter Day, it was considered a continuation of the feast, though in a lower degree.

Lowth, Robert (1710-87), English ecclesiastic and scholar. His *De Sacra Poesi Hæbrarum Prælectiones Academicæ* (translated in 1787 as *Lectures on the Sacred Poetry of the Hebrews*), published in 1753, marked a new departure in the application to Biblical poetry of the ordinary criteria of literary criticism. Among his other works are an excellent *Short Introduction to English Grammar* (1762), often reprinted; and *Isaiah: a New Translation* (1778). An edition of his *Popular Works* appeared in 1843.

Loyalists, or **Tories**, the name given in American history, to those who, immediately before and during the Revolutionary War, remained loyal to Great Britain. Their number is unknown, but John Adams estimated that at least one-third of the inhabitants of the revolting colonies were Loyalists, known later as United Empire Loyalists. In general they represented the characteristically conservative element, including colonial office holders, the more prosperous merchants and business men, representatives of the professional and cultivated classes—in short, the official, industrial and intellectual aristocracy—to whom were added a number of time-servers who believed that the colonists would inevitably lose and who wished to be on the winning side. Consult Van Tyne's *The Loyalists of the American Revolution*.

Loyal Legion of the United States, Military Order of. An organization formed in 1865 by officers of the army, navy and marine corps who took part in the Civil War.

Loyalty Islands, a group of islands in the South Pacific, forming a chain parallel to and included in the French administration of New Caledonia, at a distance of 60 miles e. of that island. The islands grow bananas and export sandal wood and rubber; p. about 11,000.

Loyola, Ignatius de—Inigo Lopez de Recalde—(c. 1491-1556), the founder of the Jesuits, was born of a noble family in the Spanish province of Guipuzcoa. He spent ten months in a cave near Manresa, practising terrible austerities, and here he composed the famous book of *Spiritual Exercises*, which was to prove so powerful an influence in the training of his followers. He conceived also the idea of recruiting a regiment which should be a *corps d'élite*, drilled to a most perfect discipline, and ready to volunteer for any emergency. He went to school with children to learn the rudiments of Latin, and then studied at the universities of Alcalá, Salamanca, and Paris. At Paris he gathered round him a small band of companions, the most famous of whom was St. Francis Xavier. They met again in Rome in 1537, and were cordially welcomed by Paul III., who in 1540 issued a bull approving the new order. Ignatius was elected general (1541), and retained the office till his death. Recruits now poured in, and endless fields of activity were opened up for the new 'Company of Jesus.' Loyola was canonized (1622). His day is July 31. See Rix's *The Testament of Ignatius Loyola* (1990). The correspondence of the saint,

chiefly in Spanish, is given most completely in the *Monumenta Historica Societatis Jesu* (1894).

Lozère, department, France, in the southern part; area 1,996 sq. miles. It is one of the most mountainous departments of the country, and is divided into three parts, differing in aspect as in geological formation. The mountain pastures feed many cattle and sheep, and there are extensive forests. Iron and lead are mined, and marble, granite, lithographic stone, and slate are quarried. Flax, hemp, and fruits are produced, and silk worms are bred; p. 108,822.

Lozier, Clemence Sophia (1812-88), American physician, was born in Plainfield, N. J. She was married (1829) to A. W. Lozier of New York City, after his death conducted a school for eleven years, and then studied medicine. She began to practice in New York City, where she became noted as a surgeon in gynecological cases. She gave private medical lectures to women, and in 1863 effected the establishment of the New York Medical College and Hospital for Women, in which she was a professor and dean of the faculty for many years.

L.S., loco sigilli—i.e. 'the place of the seal.' Initials employed on legal instruments requiring a seal, to indicate the proper place for affixing the same.

Lubao, pueblo, Luzon, Philippine Islands. It is a rich sugar, indigo, and rice district; p. 21,614.

Lubec, town, Maine. It is a watering place beautifully situated on an arm of the sea, behind Campo Bello Island. The leading industry is the canning of smoked and of boneless herring; p. 3,108.

Lübeck, free state, Germany. The country is fertile, well wooded, and produces rye, wheat, barley, potatoes, oats, hay, and large quantities of fruit; p. 127,971.

Lübeck, city, German, in the state of Lübeck. It is a quaint appearing town and contains many good examples of mediæval architecture: the famous Holstenthor, a 15th-century brick-built gateway, restored in 1870; the Marienkirche, founded in 1170, containing valuable works of art; the town hall (1250), built of black glazed bricks in the style of the Renaissance period. The principal shipping trade comprises machinery, chemicals, preserved food, linen goods, and cigars; p. 120,758.

Lubitsch, Ernst (1892-), cinema director, born in Berlin, Germany, began his career as an actor in his native country. In

1922 he came to America to direct Mary Pickford, and has remained an American director since. Among his many celebrated pictures are *Lady Windemere's Fan*, *The Patriot*, and *The Love Parade*.

Lublin, co., Poland, near the central part. Of the surface, almost one-third is forest, less than a twelfth is pasture land, and most of the rest is arable. The chief crops are rye, wheat, oats and potatoes; of less importance are hemp, flax, and beetroot. The chief industries are distilling, sugar-making, flour-milling, brewing, tanning, sawmilling, and furniture making; p. 2,087,951.

Lublin, city, Poland, capital of the county of Lublin. It has considerable trade, especially in corn, wine, and linen cloth. Distilleries, breweries, tanneries, brickworks, soap, tobacco, and candle manufactures, and flour mills are the main industries; p. 94,412.

Lubricants and Lubricators, materials that are introduced between moving surfaces, in order to reduce the friction between them, and to prevent wearing and becoming hot. Lubricants are of varied nature, differing according to the nature of the surfaces in contact, and the speed, pressure, and temperature at which the motion takes place. They may be either solid, semi-solid, or liquid. The first-named, graphite, for example, acts chiefly by filling up the roughnesses of the surfaces in contact, and coats them with a soft and slippery material. Liquid and semi-solid lubricants are of far greater importance, and vary from limpid oils to stiff greases, being almost invariably either hydrocarbon oils, of mineral origin and of high boiling point; vegetable or animal fatty oils, such as olive, rape, castor, lard, and sperm oils; or mixtures of the two, often thickened or 'solidified' with soaps and other substances.

Lubricators are the mechanical contrivances used to insure a constant supply of the oil or other lubricant to rubbing surfaces. One type is an oil cup for simple bearings. The oil is drawn out of the cup, down the center hole leading to the bearing, by means of the capillary attraction of a wick, which is first well soaked in oil. The supply of oil is regulated by the amount of wick used. Another type is a compression grease cup, in which semi-solid grease is used as a lubricant. The lubricator is filled with grease, and then on screwing the piston down the grease is forced along the pipe to the bearing. In practice, an occasional turn of the handle is all that is necessary. Still another is an oiler with a sight freed so as to show how much oil is

being supplied to the bearing. It consists of a reservoir, usually of glass, having a hole at the bottom to the shaft. The flow of oil is regulated by adjusting the feed screws. For passing oil into the steam-pipe or value-chest of a steam-engine, this sight-feed lubricator is often used. In this form of lubricator steam is condensed in a small coil provided for the purpose, and displaces the oil drop by drop. Modern practice tends toward forced lubrication to all bearings, especially on fast running machinery. Consult Battle's *Handbook of Industrial Oil Engineering* (1920); Hurst's *Lubricating Oils, Fat and Grease* (1925); Ettele's *Lubricating Oil Salesman's Primer* (1926).

Lucan, Marcus Annæus Lucanus (39-65 A.D.), the chief Roman poet of the 'silver age,' was born in Corduba, Spain. His only surviving work is the *Pharsalia*, an unfinished story of the civil war between Cæsar and Pompey.

Lucania, division of ancient Italy. The Lucanians were of Samnite race, and were subdued by the Romans in 272 B.C.

Lucas, Edward Verrall (1868-1938), British author. He was a versatile writer, being at once a fine essayist, a delightful writer for children and a particularly interesting author of books of travel. His many publications include *Highways and Byways in Sussex* (1904); *A Wanderer in Holland* (1905); *Old Lamps for New* (1912); *Landmarks* (1914); *Zigzags in France* (1925); *The Joy of Life* (1927); *English Leaves* (1933).

Lucas, John Seymour (1849-1923), English historical and portrait painter. Among his best works are *The Armada in Sight* (1880), a vigorous representation of Drake finishing his game of bowls on Plymouth Hoe; *William the Conqueror Granting the First Charter to the City of London* (1898); *After Culloden* (1884); *Flirtation*.

Lucas van Leyden (1494-1533), Dutch painter and engraver. His art is characterized by precision of detail and frank realism. Among his paintings the best examples are *The Last Judgment*, *Christ Healing the Blind Man of Jericho*, and *The Card Party*.

Lucca, town, Italy. Its cathedral of San Martino (11th century) is rich in paintings and sculpture. Many of its churches are fine examples of mediæval architecture. The ducal palace contains a fine picture gallery with good examples of Fra Bartolommeo. The town has extensive silk mills; jute, velvets, tobacco, and cottons are also manufactured. It is famous for its olive oil. In the valley of

the Serchio River are the famous baths of Lucca; p. 79,985.

Lucena, city, Spain, has manufactures of textiles, bronzes, and earthenware. Red wines and brandy are also produced; and a famous breed of horses is reared in the neighborhood; p. 23,050.

Lucera, town, Italy. Features of interest are a fourteenth century cathedral, formerly a Saracenic mosque, and a castle built by Frederick II. There is a good trade in silk; p. 22,000.

Lucerne, canton, Switzerland, in the n. central part; area, 575 sq. miles. It is largely agricultural, and stock raising is important; p. 177,073, mainly German-speaking Roman Catholics.

Lucerne, city, Switzerland, capital of the canton of Lucerne, picturesquely built on both banks of the Reuss as it issues from Lake Lucerne. It is now the chief center of foreign tourists in summer. To the e. rises the celebrated panorama of the Rigi and to the southwest towers the magnificent peak of Pilatus. The main features of interest in the town are its mediæval towers and walls, the six bridges, including the covered wooden bridge, with its paintings, representing scenes from the lives of patron saints, and a 'Dance of Death'; the Quai National and the Schweizerhof Quai; the Hofkirche, erected in 1506; the town hall, containing antiquarian and art collections; and the 'Lion of Lucerne,' a rock monument modelled by Thorwaldsen. Industrially the city is not important, its chief business being the accommodation of a large annual army of tourist visitors; p. 45,930.

Lucerne, Lake ('Lake of the Four Forest Cantons'), one of the most beautiful of European lakes, in the north central part of Switzerland. Arta, 44½ sq. miles; length, about 23 miles; depth, 700 ft. The lake is subject to sudden and violent storms.

Lucian (c.120-190 A.D.), the greatest Greek writer of the Christian era. It is as a satirist that he has won immortality. Perhaps his most characteristic works are those which deal with the next world, the *Dialogues of the Dead*, the *Necyomanteia*, and others; those which satirize the gods, the *Tragic Zeus*, the *Icaromenippus*, and others, but his *Vera Historia* has had more influence on modern literature, having inspired Rabelais, Swift, and Voltaire. Consult Hime's *Lucian the Syrian Satirist*.

Lucifer, the Latin name of the planet Venus when it appears as a morning star; it

corresponds to the Greek Phosphorus. As the evening star, it is called Vesper or Hesperus. In mythology, Lucifer was represented as a son of Astræus or Cephalus and Aurora (the dawn). The name is used to translate the Hebrew *heloî*, 'shining one.' Owing to a false comparison of Luke ('I beheld Satan as lightning fall from heaven') with the passage in Isaiah, some fathers regard the name as applying to Satan, and it is so used by various writers.

Lucilius, Gaius (c. 160-103 B.C.), a Roman poet, the founder of the Roman school of satirical poetry, represented in later centuries by Horace, Persius, and Juvenal. He wrote with extreme rapidity and carelessness, but his vigor, his wit, and his imagery at once made him one of the first of Latin poets. Of his works some eight hundred fragments remain. The best editions of the fragments are those of Müller (1872) and Lachmann (1876).

Lucina, in Roman mythology the goddess of light, or rather the goddess who brings to light, presiding over the birth of children. Both Juno and Diana had the surname of Lucina. She corresponds to the Greek Ilithyia.

Luckner, Felix von, Count (1886-), German naval officer in World War I. He destroyed a large amount of shipping, earning the title of 'Sea Devil.'

Lucknow, town, India, the chief town of Lucknow district, picturesquely situated on the Gumti. The river forms a waterway to the e. coast. Lucknow is an important educational center, having, besides the Canning and Martinière Colleges, numerous missionary schools. Pathetic interest is attached to the ruined residency, with its cross and graveyard in memory of those who perished in its gallant defence against the mutineers in 1857. The leading industries are the manufacture of muslins and shawls, gold and silver embroidery, glass, and pottery, gold, silver and brass work, clay figures and cotton fabrics; p. 274, 659.

Lucretia, the wife of Lucius Tarquinius Collatinus. It is said that when the Romans were engaged in the siege of Gabii, Lucius Tarquinius and other nobles vied with each other in praising the virtue of their wives. To test which best deserved their praise, they returned suddenly to Rome, and found Lucretia alone, duly engaged in her household tasks. Soon afterwards her husband's cousin, the infamous Sextus Tarquinius, forced his way into her house at night and outraged Lucretia. Next morning she summoned her

husband and father, and after telling her experience stabbed herself to death (509 B.C.). The tale is told by Livy and Ovid.

Lucretius (c. 98-55 B.C.), Roman poet, whose full name Titus Lucretius Carus. His great work, *De Rerum Natura*, a poem in six books, amounting to upwards of 7,400 hexameters, is an exposition of the philosophy of Epicurus, in which he believed. It is Lucretius' first object, as it was that of Epicurus, to free mankind from the fear of the supernatural, of death and the life hereafter. The world arose from the fortuitous concourse of atoms moving through space. Thus all phenomena were material in origin, and death simply meant the resolution of the body into its component atoms.

Lucrinus Lacus, a small salt water lake, Italy, really the inner part of the Bay of Cumæ. In 1538 A.D. the Lucrine lake was filled up by a volcanic eruption, a conical hill, the Monte Nuovo, being formed on its site.

Lucullus, Lucius Licinius (c. 110 B.C.-57 B.C.) famous Roman general, who belonged to a plebeian family. Plutarch has left a *Life* of Lucullus.

Luddite Riots, outbreaks in which the popular discontent expressed itself in the Midlands of England about 1811-18, against the new machinery, much of which was destroyed. The name was derived from Ned Lud, a Leicestershire imbecile, who, in a fit of passion, demolished two stocking-frames.

Ludendorff, Erich (1862-1937), German general and politician, the son of a Posen farmer. The glory of the Tannenberg Battle was shared by Ludendorff with von Hindenburg and many regarded him as the real master of the German military machine in the World War. As Quartermaster-General he challenged even the authority of the Emperor. Critics on the Allied side conceded that he was a master strategist. He established a political section at general headquarters in the last months of the conflict and tried to sustain the will to war. He was suspected of implication in the Hitler putsch at Munich (1923), but a court acquitted him. He quarreled with Hitler later and only in 1935 did he reveal a tendency to support the Nazi regime. His second wife was an antisemitic agitator. The old general declared himself an anti-Christian and a heathen.

Ludendscheid, town, Prussia. It has manufactures of cutlery, musical instruments, hardware, machinery, and cotton and has iron foundries; p. 32,808.

Ludhiana, town, India. Features of interest are the shrine of Abdul-Kadir-i-Jalani, which attracts many pilgrims, the fort and the public gardens. It has trade in grain, and manufactures shawls, cloths and turbans of Rampar wool; p. 44,200.

Ludlow, James Meeker (1841-1932), American clergyman and author, was born in Elizabeth, N. J. In 1881 Dr. Ludlow made a tour of the countries of the eastern Mediterranean, in which region is laid the scene of his successful romance, *The Captain of the Janizaries; A Story of the Times of Scanderberg and the Fall of Constantinople* (1886). Other works are *A King of Tyre* (1891); *Incentives for Life* (1902); *Judge West's Opinion* (1908); *Avante!* (1912); *Along the Friendly Road* (1919).

Ludlow, William (1843-1901), American soldier, was born in Islip, Long Island, N. Y. After serving in the Civil War he was engaged in various engineering operations; became president of the U. S. Nicaragua Canal Commission in 1895; was military governor of Havana, 1898-1900; and in 1901 he was assigned to duty in the Philippines.

Ludwig, or Louis, the name of several German emperors.

Ludwig I. (1786-1868), king of Bavaria, son of King Maximilian Joseph, whom he succeeded (1825). He supported the Greek struggle for independence (1826), erected fine public buildings and encouraged arts and letters but abdicated because of his refusal to grant political reforms (1848).

Ludwig II., Otto Friedrich Wilhelm (1845-86), grandson of Ludwig I., succeeded his father, Maximilian II. (1864). An extraordinary passion for building palaces on a huge and expensive scale induced an inquiry to be made as to his mental condition, and he was declared insane. Shortly afterwards he drowned himself in a neighboring lake. Ludwig was the lifelong friend and supporter of Richard Wagner, on whom he showered gifts and honors.

Ludwig, Emil (1881-), German biographer and dramatist, was educated at Breslau and Heidelberg. He began writing plays as a boy and six of them reached the stage before he was thirty. His books included lives of *Jesus, Napoleon, Bismarck, Goethe, William II, and Lincoln*. He took the Iron Chancellor's prose style as his model and interested himself in the interaction between genius and character. *July, 1914*, discussed the events preceding the World War and distributed the blame among the powers. The Nazi regime in

Germany found Ludwig living in Switzerland, where he became a citizen. Among his later books are lives of *Simon Bolivar* and of *Beethoven* (1943).

Ludwig, Karl Friedrich Wilhelm (1816-95), German physiologist, was born in Witzzenhausen, Hesse. He was the inventor of the mercurial bloodpump. Ludwig was one of the most celebrated of modern physiologists, and expressed many original ideas on the subject in his *Lehrbuch der Physiologie des Menschen* (1852-56).

Ludwigsburg, town, Germany, is the principal military depot of Württemberg, and has a cannon foundry and arsenal. Manufactures include metallic wares, musical instruments, chemicals, cotton and woolen goods; p. 30,000.

Ludwigshafen, town, Germany, has important manufactures of aniline dyes, soda, fertilizers, shoddy, flour, vinegar, refrigerators and woolen goods, and does a large trade in timber, iron, and coal. The chemical works are among the largest in the world. It was heavily bombed in World War II.

Luff, the order to the helmsman to put the tiller towards the lee side of a ship, in order to make her sail nearer to the direction of the wind. Also, the weather edge of a sail.

Luftwaffe, "air arm" of Nazi Germany.

Lugano, town, Switzerland. Though politically Swiss, Lugano is Italian in every other respect. The town is much frequented by visitors in spring and in autumn; p. 15,440.

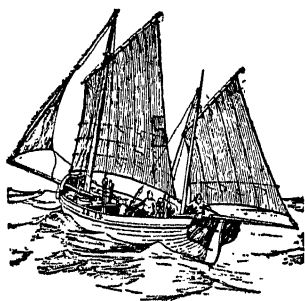
Lugano, Lake of, a celebrated Italian lake, lying in both Switzerland and Italy. The scenery is beautiful and striking, the surrounding mountains rising abruptly and affording a much diversified view. The lake is about 20 miles long, 1½ miles wide, and in some places has the unusual depth of about 950 ft.

Lugansk, or **Lugan**, town, Ukraine, Russia. It has an important trade in grain, cattle, copper, and wool. There are iron, coal, and anthracite mines in the neighborhood. The industrial establishments include iron foundries, blast-furnaces, cannon foundries, and engine shops; p. 75,000.

Lugger, a small vessel having one, two, or three masts, upon each of which is set a square 'lugsail.' She may also carry topsails, and have a bowsprit on which are set one or more jibs. The lugsails of a lugger hang obliquely to the masts, their yards being slung at one-third of their length. Luggers sail close to the wind, and particularly well when close-hauled.

Lugo, province, Spain; area, 3,814 sq. m. It is an extremely mountainous district, with a coast-line on Bay of Biscay. The slopes of the ranges produce cattle and timber; the valleys abound in agricultural supplies and fibres. There are mines of copper and lead, and quarries of slate, granite, and marble; p. 480,705.

Lugo, town, Italy. It has a 15th-century castle and a technical school. An annual fair attracts many visitors. Leading industries are the manufacture of furniture and rope; p. 28,000.



Lugger

Lugo, city, Spain, capital of the province of Lugo. There are many curious Roman remains, including the ancient walls and the *thermæ*, still much frequented in summer; p. 37,024.

Lugos, town, Roumania. In the vicinity are extensive vineyards and wine making is the leading industry; p. 20,000.

Lug-worm, or **Lob-worm**, a marine segmented worm greatly prized as food by many ground-feeding fish. The animal, which sometimes reaches a foot in length, is especially common in Great Britain.

Luini, Bernardino (c. 1475-c. 1533), Italian painter of the Lombard-Milanese school, was born in Luino. His painting shows to a marked degree the influence of Leonardo da Vinci, to whom much of it was formerly ascribed. It is characterized by great sweetness and depth of feeling, and is excellent in color and draughtsmanship, but in sense of perspective is not equal to that of his contemporaries. Among his works are a *Pieta*, *St. Catherine Borne by Angels*, *Marriage of the Virgin*, *Christ among the Doctors*, *Presentation in the Temple*, *Modesty and Vanity*, *Christ Crowned with Thorns*.

Luise, Auguste Wilhelmine Amalie (1776-1810), queen of Prussia, daughter of

Karl, in 1793 married the prince-royal of Prussia, afterwards Frederick William III.

Lukas, Paul (1895-), American actor, was born in Hungary. He has starred in *Strictly Dishonorable*, *Little Women*, *A Doll's House*, *Watch on the Rhine*.

Luke, The Gospel According to, the third book in the canon of the New Testament, often called the 'third gospel.' It presents a well-ordered account of the public ministry of Jesus based upon personal knowledge and upon earlier records, which some think to be the Mark narrative and the Matthew *logia*. The very full account of the birth and infancy of Jesus from unknown sources is a noteworthy feature of the book. Ancient tradition identifies the author with Luke, 'the beloved physician,' the companion of the Apostle Paul; and makes him one with the writer (or composer) of the book of Acts, but on this point scholars are not in agreement.

Lulea, river of Northern Sweden, rises in two sources near the lofty Sulitelma (6,200 ft.), and after forming a series of lakes and many imposing waterfalls, reaches the Gulf of Bothnia at Lulea. Length, 255 miles.

Lulea, port of Sweden, at the mouth of the Lulea River. Owing to repeated fires it has been often rebuilt and as a result presents a fine appearance. Lulea is an important shipping port for iron ore; p. 11,258.

Lull, Ramon (c. 1235-1315), Spanish Christian philosopher, known as the 'enlightened doctor.' To him were due the study of oriental tongues in Oxford, Paris, Bologna, and other seats of learning, and the foundation of the Lullian school of rational Christianity. His principal works are *Ars Brevis* and *Ars Magna*.

Lully, Giovanni Battista (1633-87), musical composer and the founder of French opera, was born in Florence, and taken in boyhood to Paris. In conjunction with Quinault, Lully composed numerous operas, and also wrote many ballets as well as sacred music. His most important compositions are *Alceste* (1674), *Thésée* (1675), *Persée* (1682), and *Armide* (1686).

Lumbago (Lat. *lumbus*, 'loin'), an acute form of muscular rheumatism involving the region of the sacrum and loins. It is sudden in its onset and is characterized by severe pain. The patient, on attempting to rise from a stooping posture, has a sensation of being gripped across the loins, and is at first powerless to move. After a time, and with considerable pain, he may straighten his back,

but he then finds himself unable to stoop. Lumbago is seldom accompanied by rise of temperature or by much disturbance of the general health, and at the end of an attack the pain and stiffness may disappear as suddenly as they came.

Lumbar Puncture, the taping of the spinal membranes in the lumbar region for the withdrawal of spinal fluid, either for examination or for therapeutic purposes, as for the relief of intracranial pressure.

Lumbering comprises three broad lines of work: logging, or the cutting and removal of timber from the forest, lumber manufacture.

saw-logs are carried by gravity. Occasionally flumes built of lumber and carrying water are used for small logs, though the flume is more commonly employed for sawn lumber. Lumber is cut directly from the log in its green state as taken from the woods. Some mills cut up to a million or more board feet per day. In general, in manufacturing lumber, the log is placed upon a carriage in the sawmill, and sawed in such a manner as to produce the highest quality stock which can be obtained from the log.

The bulk of the product of the sawmill is lumber, in the form of boards, dimension

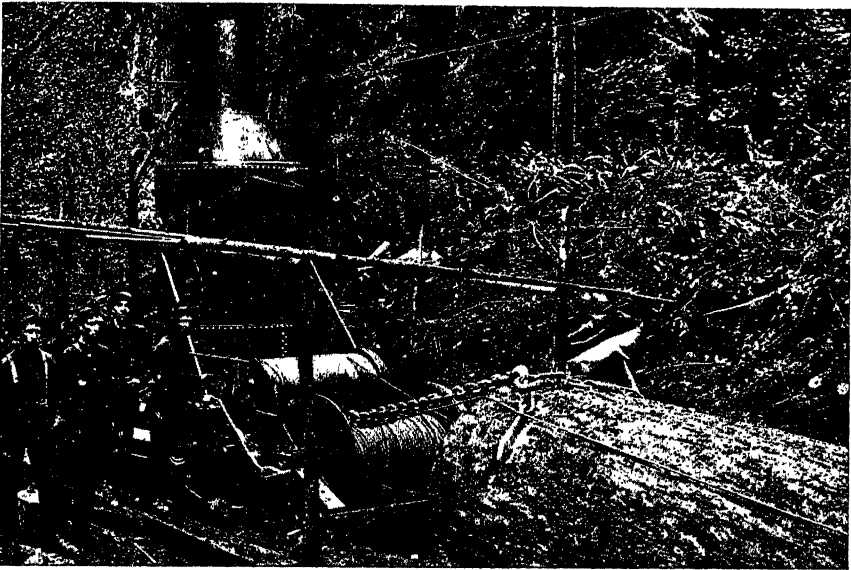


Photo by Gifford and Prentiss, Portland, Ore.

Courtesy U. S. Forest Service.

Drawing Logs by means of a Stationary Engine and Cable.

and lumber distribution. The work of logging varies from the simple methods of the farmer, who cuts a few logs and hauls them on a wagon to a local sawmill, to the highly organized operations of steam skidding and railroad transportation of the logs. The old method of floating is still common where suitable streams exist. On smaller streams so-called splash-dams are built to control the water and make an artificial flood; on larger streams the natural high water of the spring is relied upon to carry the logs down stream, where they are caught in booms at different points. In the rugged mountain regions, logs are sometimes taken out over slides, rough troughs, usually built of logs, over which the

stock, flitches, squares and blocks, railroad cross-ties, etc. These are essentially primary products, some of which are used in the form produced at the mill and further manufactured into a great variety of wooden articles and implements. Many sawmills manufacture also lath, shingles, box-shooks, forms for turning, finished flooring, molding, and other products. The secondary manufacture of wood products is, however, usually classed under the wood-using industries. In May 1922, the first grade American lumber conference was held for the purpose of forming rules for the commercial grading of lumber. American lumber standards were then formed; and lumber was described as the

product of the saw and planing mill, not further manufactured than by sawing, re-sawing, and passing lengthwise through a standard machine, or cross-cut to length and matched. Softwood lumber was classified as yard lumber, structural material, and factory and shop lumber. Yard lumber is lumber that is less than 5 inches in thickness and is intended for general building purposes. Structural material is lumber 5 inches or over in thickness and width. Factory and shop lumber is lumber intended to be cut up for the use in further manufacture.

Lumber distribution constitutes an important branch of the lumber industry, and its cost is a large element in the ultimate cost to the consumer. The distribution of lumber, as a rule, is carried on by a different group of men from those engaged in lumber production. In the last few years, however, a number of large lumber producers have developed both a wholesale and retail business. Special developments are the line-yard business, a chain of retail yards many of them owned and operated by great lumber manufacturers, and some of them operating over 100 lumber yards; and the co-operative yards operated by organized consumers, a movement analogous to the co-operative buying and selling by associations of farmers and fruit growers. The lumber industry as a whole is one of the largest industries in the United States. The lumber output of the United States over a number of years, expressed in board feet, is as follows:

1869	12,755,000,000
1879	18,091,000,000
1889	23,845,000,000
1899	35,084,000,000
1909	44,510,000,000
1919	34,552,000,000
1920	33,799,000,000
1921	26,961,000,000
1922	31,569,000,000
1923	37,166,000,000
1924	35,931,000,000
1925	38,339,000,000
1926	36,936,000,000
1927	34,532,000,000
1928	34,142,000,000
1929	36,886,000,000
1930	26,051,000,000
1931	16,523,000,000
1932	10,151,000,000
1933	13,961,000,000
1934	15,494,000,000
1935	19,539,000,000

1936	24,355,000,000
1937	25,997,000,000
1938	21,646,000,000
1939	24,975,000,000
1940	28,934,000,000
1941	31,500,000,000
1942	33,500,000,000

The principal lumbers are: yellow pine, Douglas fir, western yellow pine, oak, hemlock, white pine, red gum, maple, spruce, cypress, redwood, yellow poplar, birch, sugar pine, cedar, tupelo, white fir, chestnut, larch, beech, cottonwood, ash, basswood, walnut.

The woodlands of the United States have been depleted more by the ravages of forest fires than by normal lumbering operations. In recent years there have been schemes in operation in the United States for the curtailment of hardwood output. The wanton destruction of clearing areas by burning has now given place to more practical care, prevention of fire outbreaks, and the general protection of trees. Moreover, it is now realized that the profits of sawmills rest largely on the proper utilization of sawmill waste. See FORESTS; FORESTRY; WOOD.

Luminescence, the emission of light apart from incandescence. There are many varieties of this phenomenon. Thus, it may be set up by the glow of phosphorus or of the firefly; or it may be caused by the action of both visible and invisible light, as in the case of the fluorescence of quinine solutions or the phosphorescence of luminous paint. Electric discharges are also a fruitful source of luminescence; also the fluorescence of screens coated with substances such as barium platino-cyanide; whilst the similar effects produced by radium itself, or by the action of radium rays, on these screens, on diamonds, and on zinc blende, are probably ascribable to similar causes. Luminescence is also caused by friction, as when sugar is crushed; and in other ways.

Luminosity (intrinsic) is the amount of light emitted per unit of area of a shining body. It is due in most cases to the body being hot, an object becoming visible in the dark when between 400° and 500° C., bright red at about 900° C., and white at 1,200° C. approximately. Most of the luminous bodies that owe their light to incandescence are in the solid state. Flames of burning hydrocarbons, as of coal gas or candles, also owe their luminosity to the incandescent solid particles of carbon set free from the compounds present; but in other cases, such as that of oxygen

and hydrogen burnt under pressure, where solid particles cannot be present, and possibly in the case of burning hydrocarbons also, dense gases play a similar part. See PHOTOMETRY and LUMINESCENCE.

Luminous Paint contains phosphorescent powder which becomes luminescent and throws out a feeble glow of different tints for some time after it has been exposed to sunlight, or other light rich in ultra-violet rays. The earliest of these substances was 'Bologna phosphorus,' which consisted of impure barium sulphide, obtained by heating barium sulphate with carbon. Canton's phosphorus, which is calcium sulphide similarly prepared, and the corresponding strontium sulphide, also act in the same way, the effect produced being largely dependent on the presence of traces of other substances, such as manganese or bismuth. Balmain's luminous paint is stated to contain the latter element along with calcium sulphide.

Lummis, Charles Fletcher (1859-1928), American author and explorer, born in Lynn, Mass. He walked from Cincinnati (1884), 3,500 miles in 143 days. The next five years were spent in New Mexico and the Southwest studying Indian customs and languages. His books include: *A New Mexico David* (1892); *The Spanish Pioneers* (1894); *The Awakening of a Nation: Mexico* (1898); and numerous historical treatments of Spanish America.

Lumpsucker, a clumsily-built fish, common along both coasts of the N. Atlantic. The body is massive, and marked with tubercles and longitudinal ridges; the first dorsal fin is buried in a fleshy ridge in the back, while the ventral fins form a powerful sucker; the tail is short, and the fish is a poor swimmer, but it possesses the power of attaching itself firmly to rocks by means of the sucker. The breeding habits are interesting, for the male watches over the egg mass for several weeks.

Lunacy. In the legal sense, such a degree of mental unsoundness as to call for the restraint of the person afflicted or to justify the authorities in depriving him of the management of his property and affairs. 'A lawyer, when speaking of insanity,' says the late Mr. Justice Stephen, 'means conduct of a certain character; a physician means a certain disease, one of the effects of which is to produce such conduct.' The legal view of insanity is thus much more limited than the medical, since it includes only questions of

life or property, competency and responsibility, and ability to transact the affairs of life. Supposed lunacy is increasingly used as a means of securing acquittal in criminal cases, the present laws permitting psychiatrists to take sides in most cases. The courts are quite liberal in attempting to sustain wills of persons who are not wholly insane. If a person has sufficient understanding to comprehend the nature of the testamentary act, knows the nature of his property and shows clearly that he could decide why he wanted his property to go to the beneficiaries named, his will is usually received and probated. He is criminally responsible for his actions, unless from defective mental power or from mental disease he cannot understand the nature of his acts, or does not know that his act is wrong, or is unable to control his conduct—unless, in the last case, his want of control arises from his own fault. The control of the person of a lunatic is in this country regulated by statutes of the several states, and in most states there is elaborate provision of public asylums and for the supervision of private asylums. The percentage of lunacy cases recorded has steadily increased in the United States. In New York State there were 64,280 cases of insanity recorded by the State Dept. of Mental Hygiene, which has the ratio of 472.3 patients per 100,000 population. By law, a foreigner may be deported if he becomes insane within two years after arrival, from causes existing before arrival. See INSANITY.

Luna Moth. One of the largest and most conspicuous of N. American moths, measuring 5 inches across the wings, and having the hinder wings prolonged into 'tails.' It is nocturnal, often entering houses attracted by the lamp-light, and is easily caught. Its color is pale green, marked by a purplish band along the front of the fore wings, and a large eyespot on each fore wing. See Holland, *The Moth Book* (1903).

Lund, city, Sweden. In the middle of the city is the cathedral, the finest Romanesque building in Scandinavia; the old university, now the library; the new university, built 1878-82; and the botanic garden. Lund has a few industries—gloves, furniture, and iron-smelting; p. 24,000.

Lunda, extensive territory of Central Africa, divided between Portuguese W. Africa and the Congo Free State.

Lundy, small isl. lying off England, has a lighthouse, and possesses ruins of remark-

able towers, attributed to its De Marisco lords (c. 1100-1321), who owned the island concurrently with the Templars.

Lundy, Benjamin (1789-1839), American abolitionist, born at Hardwick, N. J. He traveled to Haiti, Mexico, Texas, and Canada to further his schemes for colonizing freed slaves, and lectured throughout the Eastern States, in addition to the publication of abolitionist periodicals.

Lundy's Lane, Battle of, was fought on July 25, 1814, during the War of 1812, within half a mile of the cataract of Niagara on the Canadian side. The total number of American troops engaged was about 2,000, the total British troops about 4,500. This engagement is also known as the Battle of Bridgewater and the Battle of Niagara.

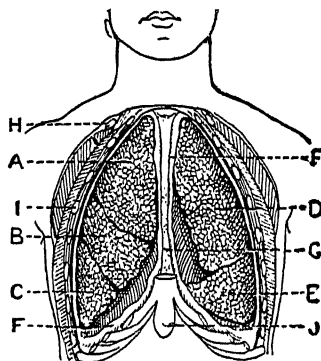
Lüneburg, town, Prussian province of Hanover, Germany, has several historic churches and public buildings dating from the fourteenth and fifteenth centuries, with fine specimens of wood carving and glass work. Manufactures include chemicals, ironware, carpets, fertilizers, cement, and barrels. Large quantities of gypsum and salt are mined; p. 27,790.

Lunette. A small vaulted aperture built in a large vaulted roof to admit light; it may then contain a window of stained or ornamental glass. If a surface takes the place of the window it furnishes opportunity for mural painting. Also in fortification, a detached work with flanks or lateral wings built for the protection of roads and bridges. See FORTIFICATION.

Lunéville, town, on the River Meurthe; one of the largest cavalry stations in France. The principal industrial products are faïence, linen, cotton, silk, hosiery, machinery, motor cars, glass, leather, and gloves; p. 25,587. Here was signed the Peace of Lunéville on Feb. 9, 1801, between Germany and her allies and France. By its terms the Rhine was made the boundary of France. Early in the Great War of Europe, Bavarian troops occupied Lunéville, but they were forced to evacuate the town by the French advance on Sept. 12.

Lungs. Comparative.—The lungs form the characteristic respiratory organs of the air-breathing vertebrates. Except in some amphibians, the original cavity of the outgrowth becomes largely filled up by a spongy network, which greatly increases the surface available for purposes of respiration, and gives to the organ its characteristic appearance. Lungs have apparently originated from the air or swim bladder of a fish-like form,

and thus afford an example of an organ which was primitively hydrostatic, and has secondly acquired a respiratory significance. The higher Amphibia, like the reptiles, have well-developed lungs, which in the chameleon among lizards communicate with a series of air sacs analogous to those which occur in birds. In birds the lungs are relatively small, and are not capable of great expansion. They are, however, remarkable in communicating with an elaborate system of air sacs, nine in number, which lie within the body cavity, and are connected in their turn with other air spaces within the bones, beneath the skin, and so on. This system gives birds their buoyancy. In mammals generally the lungs resemble those of man.



The Lungs (Human).

Human thorax, anterior wall removed, showing lungs in position: right lung—A, superior lobe; B, middle lobe; C, inferior lobe; left lung—D, superior lobe; E, inferior lobe; F, F, pleura; G, mediastinum; H, clavicle; I, ribs; J, sternum.

Anatomy.—The lungs are situated in the thoracic cavity. In color they are pinkish gray mottled with black, and in shape each is conical, the apex lying in the root of the neck, while the concave base rests upon the diaphragm. They communicate with the external air by the trachea or windpipe, which bifurcates to form a right and a left bronchus, each of which divides and subdivides throughout the entire lung. The right lung is the larger and heavier, and is divided into three lobes—upper, middle, and lower. The left lung has only two lobes, and is narrower than the right on account of the position of the heart, which lies between the two lungs, but inclines to the left side. Externally each

lung is covered by a serous sac, the pleura. The outer surface of the outer layer of the pleura is adherent to the chest wall, and is called the parietal or sometimes the costal layer; while the inner surface of the inner layer is closely adherent to the lung, and is known as the visceral or pulmonary layer. The interspace between the two layers is called the pleuritic cavity, but in health the two smooth surfaces are separated only by a little serous fluid, which acts as a lubricant. The bronchi are circular cartilaginous tubes, which by successive subdivisions diminish until their diameter is only about one-fortieth of an inch, when they lose their circular form, and terminate in irregular passages, on the sides of which are the small air sacs known as alveoli. The walls or septa between neighboring alveoli carry the pulmonary capillaries, which are distributed in a very fine network with meshes smaller than the vessels themselves. The blood is separated from the air contained in the alveolus only by the delicate capillary wall and the equally delicate epithelial cells which line the alveolus.

The blood supply to the lungs is double, one set of vessels, the bronchial, being nutritional, while the pulmonary vessels are concerned with the process of respiration, and are therefore functional, since they circulate through the lungs the blood whose purification is the province of the breathing organs.

Physiology.—All living cells require oxygen for their nourishment; and for the continuance of life the blood must constantly renew its supply of oxygen, and at the same time part with the carbon dioxide which it has washed out of the tissues. The red cells of the blood are the carriers of oxygen, which unites temporarily with the hæmoglobin contained in these cells, and gives arterial blood its characteristic bright red color, venous blood being dark and purplish. In ordinary breathing about 30 cubic inches of tidal air pass in and out of the adult lung at each respiration, but an additional 100 cubic inches of supplemental air can be expelled by forced expiration. There remains about 100 cubic inches of residual air, which no effort can drive out of the lungs. At the end of ordinary inspiration the lungs thus contain about 230 cubic inches of air, to which a further 100 cubic inches of complementary air can be added by a deep-drawn, prolonged inspiration. Expired air differs from inspired in being warmer, moister, and in having

about 5 per cent. more carbon dioxide and 5 per cent. less oxygen.

About 400 cubic ft. of air pass through the lungs of an adult in 24 hours, in which time about 9 ounces of water and 8 ounces of carbon in the form of carbon dioxide are exhaled. In ordinary breathing the respiratory act occurs about 18 times per minute, but exertion and exposure to cold accelerate the breathing, and at the same time hasten the movements of the heart, so that a greater volume of blood is poured through the lungs per minute.

Diseases.—For the more important diseases of the lungs see ASTHMA; BRONCHITIS; PLEURISY; PNEUMONIA; TUBERCULOSIS. Diseases of the lungs are characterized by four leading symptoms—pain, interference with breathing, rise of temperature, and cough. While pain is present in most pulmonary affections, it varies in severity and in character. The interference with the breathing also varies in type. Rise of temperature occurs in most pulmonary diseases, and is apt to be higher in children than in adults. A cough is an explosive effort, produced after a deep inspiration, by suddenly opening the vocal cords against which air has been compressed by the expiratory muscles, the diaphragm being relaxed.

Various circulatory derangements affect the lungs. A not uncommon condition, known as *pulmonary apoplexy*, or *hemorrhagic infarct*, results from the blocking of a branch of the pulmonary artery. *Gangrene* of the lung is a rare disease, and usually occurs only in the debilitated. *Abscess* may follow a wound or suppurative disease in a neighboring organ. *Injuries* of the lung are most frequently due to penetrating wounds of bullets or of cutting instruments, but not uncommonly the ragged end of a broken rib lacerates the underlying lung. In all such cases there is risk of air getting into the pleural cavity, either from the wound in the chest wall or from that in the lung. See THORAX.

Lungwort, a name given to members of the genus *Pulmonaria*, bearing terminal cymes of bluish flowers. One species was formerly used as a cure for lung diseases. The name lungwort is also given to a lichen with a foliaceous, leathery, spreading thallus, of an olive green color, which grows on trunks of trees in mountainous regions in North America and Europe, sometimes almost entirely covering the tree with its shaggy thallus. It also has been used as a remedy for pulmonary

diseases. It is nutritious, and when properly prepared affords a light diet, capable of being used as a substitute for Iceland moss; yet it is bitter enough to be used as a substitute for hops. It yields a brown dye. The Virginia Cowslip or Bluebell is sometimes called lungwort.

Lunt, Alfred (1893-), American actor, born in Madison, Wis., celebrated chiefly for his appearances with his wife, Lynn Fontanne, in plays sponsored by the Theatre Guild of New York. Among his plays are *The Guardsman*, *Reunion in Vienna*, *Design for Living*, and *There Shall Be No Night*.

Lupercalia, ('wolf festival'), the festival of the god Lupercus at ancient Rome; it was in origin a festival of the shepherds, and was held on Feb. 15 every year in the Lupercal on the Palatine Hill, a place which contained an altar and grove sacred to the god.

Lupine, a genus of plants of the Leguminosæ, mostly annuals, some half shrubby. They are natives of the Levant, and of the temperate regions of North and South America, about 90 species being found in the United States. The leaves are usually of great beauty, being digitately many-foliated. The flowers are in racemes or spikes, the calyx two-lipped, the keel beaked, the filaments all united at the base. The White Lupine has long been cultivated in Europe for the sake of the seeds, which are farinaceous and are used as food. The Yellow Lupine and the Egyptian White Lupine are also similarly cultivated in the s. of Europe and in Egypt. Lupines are frequently cultivated for their beautiful foliage and flowers, and are easily grown from seed in ordinary garden soil.

Lupulin, in medicine, a yellow, aromatic powder prepared from the fruit of hops; used as a tonic and in irritable conditions of the genito-urinary system. Also, in chemistry, the active principle of hops, and a volatile alkaloid extracted from hops.

Lupus, an ancient southern constellation c. of Centaur.

Lupus (Latin, 'a wolf'), a form of tuberculosis affecting the skin, in which dull or livid tubercles are developed, having a tendency to destroy or so seriously to affect the adjacent tissues, with or without ulceration, as always to lead to indelible cicatrices. Until comparatively recent years lupus was almost incurable. Koch's tuberculin has been used with good results, as have phototherapy, radium and X-rays.

Luray, town, Virginia, is beautifully situ-

ated on the western side of the Blue Ridge Mountains, and is a popular resort. Near the town is the *Luray Cavern*, one of the natural wonders of America. It underlies an area of more than 100 acres in the foothills of the Blue Ridge. Galleries rise above each other in tiers to a height of nearly 300 ft.; unexplored chambers abound; lakes and streams exist. Many of the stalactites exceed 50 ft. in length; numbers of them are hollow, giving out bell-like notes when struck; and the colors range from waxy white to yellow, brown, or rosy red. The cavern attracts thousands of visitors; p. 1511.

Lurcher, a breed of dogs, a cross between the greyhound and the sheep dog, possessing keen sight, scent, and hearing, and great intelligence. It is noted as the poacher's dog. It has rough, wiry hair, usually sandy red in color, half-erect ears, and pendant tail.

Luria, or **Loria**, **Isaac** (1534-72), one of the famous 'Five Sages' of the 16th century, chief rabbi of Lublin, was born at Jerusalem. His works are of importance on account of the numerous notices they contain connected with the history of Jewish literature.

Lurlei. See **Lorelei**.

Lurton, Horace Harmon (1844-1914), American jurist, was born in Newport, Ky. He served in the Confederate Army in the Civil War. Although a Democrat in politics he was appointed by President Taft an Associate Justice of the U. S. Supreme Court in 1909. He also was professor of constitutional law, Vanderbilt University (1898-1909).

Lushai Hills, imperfectly explored tract of country on the n.e. frontier of Eastern Bengal and Assam, India, occupied by a tribe known as *Lushais*, a warlike race who are a branch of the Kuki family. In 1890 their country became British. Area 7,200 sq. m.

Lusitania, originally the name of the territory of the ancient Spanish tribe the Lusitani. The chief town of the Lusitani was Ollisipo (Lisbon), but Emerita Augusta (Merida) was the Roman capital.

Lusitania, a British trans-Atlantic liner owned by the Cunard Steamship Company, that was sunk during the World War by a German submarine on May 7, 1915, off the southern coast of Ireland. Despite advertisement signed by the German embassy, warning Americans against travelling on British ships entering the war zone, she carried 1,257 passengers, 159 of whom were Americans. The vessel was not armed, and no high explosives, guns, or loaded shells were carried. About 1,150 men, women, and children were lost,

including 114 Americans, among whom were Charles Frohman, theatrical manager, Alfred G. Vanderbilt, capitalist, Charles Klein, dramatist, Justus Miles Forman, novelist and playwright, and Elbert Hubbard, author and lecturer. On May 10 a communication from the German government expressed 'deepest sympathy at the loss of American lives,' but urged the alleged contraband cargo of the vessel and English starvation methods as justification for the attack. On May 13, President Wilson demanded a disavowal of those acts, requested reparation, and insisted on a modification of German submarine practice. The German government declared in reply (May 29) that the *Lusitania* carried masked cannon, Canadian troops, and ammunition, and to the explosion of the last named the great loss of life was due.

These allegations were denied by President Wilson, and a long series of negotiations followed, resulting (January, 1916), in the submission by the German government of the draft of an agreement whereby Germany assumed liability for the sinking of the vessel and offered indemnity. This, however, was rejected by the United States, and the affair was still unsettled when diplomatic relations between the two countries were severed on Feb. 3, 1917.

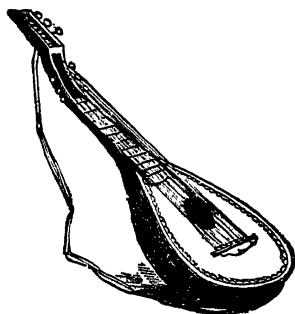
Lussan, Zélie de (1863), American soprano singer, was born in New York of French parents. In 1894 she appeared at the Metropolitan Opera House in New York as Carmen; and later sang with success in England, France, and Spain, and made frequent concert tours in the United States. Her chief parts are Carmen (over 600 times), Mignon Musette in *La Bohème*, Zerlina in *Don Giovanni*, and Marguerite in Berlioz' *Damnation of Faust*.

Lustre, in physical optics, is a characteristic appearance of certain substances when viewed in ordinary light. Thus, there is the metallic lustre possessed by many metals. The effect depends upon the manner in which the incident light is partly absorbed and partly sent back after a slight penetration into the surface layers. In the case of transparent or translucent bodies, like precious stones and crystals generally, the lustre must be largely conditioned by the refractive power of the substance. See REFLECTION AND REFRACTION.

Lustrum (from *luere*, 'to purify' or 'expiate'), the solemn offering made for expiation and purification by one of the censors in the name of the Roman people at the

conclusion of the census. The animals offered in sacrifice were a boar (*sus*), sheep (*ovis*), and bull (*taurus*), whence the offering was called *Souvetaurilia*.

Lute, a stringed instrument of Asiatic origin, popular for centuries, but now obsolete in Europe, though music for the instrument was published so late as 1670. The lute resembled somewhat the present form of mandolin. The archlute, chitarrone, and theorbo



Lute.

were all large forms of double-necked lutes, having the neck extended to contain another set of pegs regulating unstopped strings which ran alongside and not above the finger-board. Music for the lute was written in the form of notation termed 'tablature.'

Lutes are cements used for making the joints of certain apparatus air-tight. See CEMENT.

Lutetia, or in full **Lutetia Parisiorum**, 'the city of the Parisii,' was the ancient name of Paris.

Luther, Martin (1483-1546), the leader of the Protestant reformation in Germany, was the son of Johann Luther, originally a peasant-proprietor who migrated to Eisleben, in Saxony, where the reformer was born on St. Martin's Eve (November 10). In 1501 he took residence at the University of Erfurt, as a student of law, read widely in the classical and scholastic authors. The death of a young friend, and the experience of a dreadful storm, acting on a self-distrustful heart, weaned him from jurisprudence and for peace of soul he entered the convent of the Augustinian monks at Erfurt, July 17, 1505. In the convent he submitted to the most stringent discipline, and in course of time resumed his reading, pondering especially over the fathers and the Bible; but he failed to gain the peace of mind he craved for, and fell into a state of morbid melancholy. From

this he was eventually delivered and he left Erfurt in 1508 for a chair in the newly-founded University of Wittenberg, though he remained a monk and lived in a cell, and here his preaching began to attract attention. His expositions of the Bible were listened to by students from all parts; his study of Augustine and the mystics, but especially his use of plain, nervous vernacular speech gave a fresh and striking tone to his discourses. About this time there came to the Wittenberg district the Dominican monk Tetzel, preaching some new indulgences which had been recently granted by Pope Leo x. Luther took issue with Tetzel, and made the decisive step

Nation, On the Liberty of the Christian Man, and The Babylonian Captivity of the Church (1520), which won to his side practically all the patriotism of Germany. Meanwhile a papal bull condemning Luther had been prepared in Rome, and was published in Germany; but Luther's rejoinder was to burn it openly in Wittenberg. He retracted nothing, and an edict of condemnation was passed by trickery. But Luther had been kidnapped by his friendly elector, and conveyed to the Wartburg. Here Luther resumed his writing of books and pamphlets. In March, 1522, he was in Wittenberg again, preaching, itinerating, and publishing with unabated zeal. But



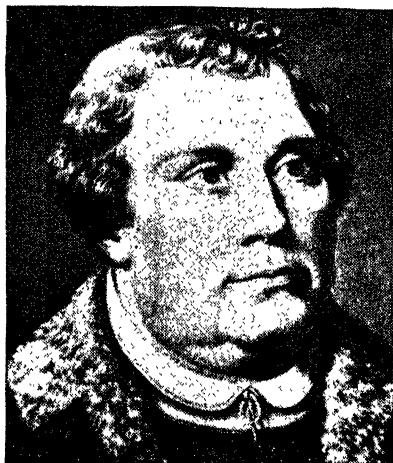
Luther before the Diet of Worms.

of nailing to the church door at Wittenberg his ninety-five theses in Latin, as a public protest against the Pope's emissary. This was on October 31, 1517, which may thus be reckoned the birthday of the Reformation. Copies of the theses were circulated, bought, and read everywhere; the movement towards the new teaching proceeded apace, and the popular desire to acquire indulgences declined.

The Pope summoned Luther to Augsburg (1518), where the papal legate Cajetan dismissed him in great anger. Luther gained delay by an appeal to a general council of the church, but the celebrated Dr. Eck forced his hand by challenging him and Carlstadt to a public disputation at Leipzig (1519). The chief result of the debate was Luther's publication of the famous treatises *An Address to the Nobility of the German*

the seeds of reform already sown were now springing up of themselves on every side. The laboring classes, groaning under the taxation of the nobles and the church, gave ready ear to Luther's assertion of the equal freedom and value of all men in God's sight, and under Thomas Münzer raised the standard of revolt against the governing powers generally. The excesses of the insurgents called forth some of the most violent language Luther ever uttered. By his hymns (both words and music), by the institution of schools, and the drawing up of catechisms, he deepened the devotional and educational aspects of the Reformation, and fixed its principles in the hearts and lives of the people. Luther's labors as author, organizer, and adviser of nobles continued to the end. Luther is reckoned by Carlyle among the 'heroes' of

the race. A signal flaw in his character was his tendency to use rude and intemperate language toward his adversaries. His *Sämmtliche Werke*, in 67 vols., were published at Erlangen (1826-57); re-issue Weimar from 1883; people's ed. 1892; *Briefe*, ed. De Wette (5 vols. 1825-28); *Table Talk* (1883).



Martin Luther.

Luther League of America. A young people's association formed of individual societies within the Lutheran churches. Any local society of whatever name connected with a Lutheran congregation or a Lutheran institution of learning is entitled to membership. Its fundamental principles are federation and co-operation. It is a training school for leadership, providing for every age from six to thirty. Its Journal is *The Luther League Review*, Philadelphia, where its headquarters are situated.

Lutherans, the designation given to the branches of Protestantism which have accepted the principles expressed by Martin Luther in contradistinction to the Reformed Church (Swiss, Anglican, Scottish Presbyterian, and others). Lutheranism represents the conservative form of the Reformation, and rests upon the central doctrine of justification by faith. It accepts the Apostles', the Nicene, and the Athanasian Creeds, and the confessions set forth in the Augsburg Confession, the Apology of the Augsburg Confession, Luther's two Catechisms, the Schmalkald Articles, and the Formula of Concord. Lutheranism accepts the Scriptures as determining the entire policy of the Church: the festivals, liturgy, and scope of the ministerial function;

the form of church government; the unity of the Church; the scope of social work; the truth or falsity of modern criticism. The Lutheran form of worship is liturgical, and is modelled after the missals and order of service prepared by Luther; but there is no uniform liturgy in use among the different branches. Congregational singing is a feature of the order of worship, and the great festivals of the Christian year are commemorated with religious services. The history of Lutheranism begins with the promulgation of Luther's Ninety-five Theses in 1517; and since the establishment of the Church in 1555 it has become the prevailing form of Protestantism in Germany. From 1580 to 1689 Lutheranism in Germany was marked by the growth of a tendency to rest satisfied with mere doctrinal orthodoxy, from which it was awakened by the Pietistic movement of the seventeenth century. A period of Rationalism followed, beginning in the middle of the eighteenth century, but the year 1817 witnessed a revival of evangelical theology and religion. In the same year King Frederick William III. of Prussia carried into execution a plan of union of the Lutheran and Reformed churches into one national church; but active opposition arose, resulting in the formation of the Evangelical Lutheran Church of Prussia, sometimes known as the 'Old Lutherans.' The Evangelical Lutheran Church is the national church of Norway, Sweden, and Denmark, where its form of government is episcopalian. Lutheranism is also largely represented in Holland, Switzerland, and other European countries, and in Central and South America.

Lutheranism was introduced into America by Dutch colonists who settled on Manhattan Island (1623); by Swedes on the Delaware (1638); and by other immigrants. The Church grew rapidly in the United States because of steady immigration from Lutheran countries in Europe. In adapting itself to the political and civic conditions of the country, it has sustained changes in doctrine, government, and liturgy, although the fundamental policy remains unaltered and the Augsburg Confession forms the doctrinal standard of all. Lutheran bodies have united for specific purposes in the *National Lutheran Council*, organized in 1918, for statistical, publicity, and relief work; the *Evangelical Lutheran Synodical Conference of North America*, organized in 1872 for discussion, missionary work, etc.; the *National Lutheran Commission for Soldiers and Sailors' Welfare* (1918); and the

Lutheran World Convention Movement (1923) representing the Lutheran Church of the world. In 1938 there was a total of 5,114,250 members of Lutheran churches in the United States and Canada (includes all baptized members). In 1938 it was estimated that all the Lutherans in the world numbered between 80,000,000 and 90,000,000. Consult A. T. Jorgensen and others, *Lutheran Churches of the World* (1929); O. M. Norlie, *Cumulative Catalog of Lutheran Books in the English Language* (1924); E. Schling, *Die evangelischen Kirchenordnungen des 16ten Jahrhunderts* (1902); A. R. Wentz, *Lutheran Church in American History* (1933); publications of the *National Lutheran Council*.

Luton, (ancient *Luytone* or *Lygetune*), market town, England, the chief center of straw-plaiting in England. Other local industries include dyeing and chemical works, motor car works, and foundries. Strawplait Hall is the great market of the industry; p. 68,526.

Lutsk, or **Lutsk** (Pol. *Luck*), town, Poland. It has a château and an orthodox cathedral, and manufactures of cloth, glass, and paper. Lutsk was one of the three fortresses known in the World War as the Volhynian triangle; p. 35,700.

Lützwow, Ludwig Adolf Wilhelm, Baron von (1782-1834), Prussian general, was empowered in 1813 to raise the corps of free lances which subsequently bore his name. This body of patriots, clad in black (hence the designation 'Black Troop'), and numbering less than 500 cavalry and 3,000 foot, made for itself a notable name in the Napoleonic wars. In 1889 an infantry regiment of the German army, which traced its origin to Lützwow's corps, received his name.

Luxembourg, province, Belgium, in the extreme s.e., covered in great part by the wooded plateau of the Ardennes. Iron, marble, granite, and slate are found, and ironware, cattle, leather, and cloth are produced. Area 1,706 sq. m.; p. 221,328. Chief town, Arlon; p. 11,387.

Luxembourg Palace. See **Paris** (France).

Luxemburg (formerly **Lützelburg**), an independent grand duchy of Europe, situated between France, Belgium, and the Rhine province of Prussia. Area, 999 sq. m. The soil is extremely fertile, the principal crops being oats and potatoes. There are many vineyards. The country has rich deposits of iron ore, copper, antimony, and lead, and mining is the chief industry. The chief manufactured articles exported are metals and

metal articles, chemicals, and textiles. In 1921 an economic union was effected, to remain in force fifty years. Primary education is compulsory, and is supplemented by higher elementary schools, classical schools, commercial and industrial colleges, technical schools, teachers' training colleges, a mining school, a college of agriculture, and an academy of music. The prevailing religion is Roman Catholic. The ordinary speech of the people is a German dialect, with French as the language of official and educated classes. Luxemburg is a constitutional monarchy with the sovereign power vested in the nation; p. 299,782. The capital is Luxemburg; p. 53,791.

In August 1914, when the neutrality of her country was violated by Germany, the Grand Duchess Marie Adelaide defied the invaders. However, they remained in control during the World War without taking over the civil administration. Marie Adelaide was accused of having been too friendly with the Germans and in consequence she abdicated in 1919 in favor of her sister Charlotte (1896-). She died in Bavaria in 1924. A referendum held in September 1919 showed an overwhelming majority in favor of the reigning Grand Duchess; economic union with France. France refused in favor of Belgium and in 1922 the new economic union went into effect. German troops occupied Luxemburg May 10, 1940, and it was incorporated into the Reich in 1942. A provisional government was established in Canada.

Luxemburg, capital of the grand duchy of Luxemburg. The quaint and picturesque Upper Town occupies a high, rocky peninsula, where are located the Palace, Parliament Houses, Cathedral, and Public Gardens. On the River Alzette, 200 ft. below, are three industrial suburbs which form the more modern Lower Town. Here are establishments for the manufacture of gloves, pottery, vinegar, machinery, cloth, and powder; and in Pfaffenthal is the old Vauban Barracks, containing the National Museum; p. 53,791.

Luxor, village and chief tourist center of Upper Egypt, on the east bank of the Nile, occupying a part of the site of the ancient city of Thebes. Luxor is famous for the splendid ruins of its great Temple, which was built by Amenhotep III. about 1400 B.C. The modern village has several hotels, a mosque, an Anglican and a Roman Catholic church, and a quay, extending along the bank of the Nile; p. about 20,000.

Luz, the name of two places in Palestine. The first was a village close to Bethel; the

second was in the country of the Hittites.

Luzán, Ignacio de (1702-54), Spanish man of letters, and founder of the French school in Spain. He was the first to publish in Spanish some of Milton's verse, and his appreciations of Lope de Vega, Cervantes, and others are excellent. His 'Art of Poetry' advocating purer style and ideals, is his principal work.

Luzon, the largest and northernmost island of the Philippine archipelago. It is bounded on the east by the Pacific Ocean; on the west by the China Sea; and on the south by the San Bernardino Strait and other channels, separating it from Mindanao and Samar. Area 40,814 sq. m. (about equal to the State of Pennsylvania). There are three main mountain ranges, largely of a volcanic character, most of the craters being inactive. The most important active ones are Mayon (7,560 ft.), where a violent eruption took place in 1899-1900, and Taal, in the southern part of the main portion of the island. The two loftiest peaks are Mount Pulog (9,450 ft.) and Mount Data (7,500 ft.). Luzon is watered by several large rivers and numerous smaller ones. The Rio Grande de Cagayan, the second river of the archipelago, empties into the China Sea, and is navigable for launches of moderate draught 100 m. from tidewater. There are two large lakes, Laguna de Bay, east of Manila, and Lake Taal (Bom-bon), to the south. The vegetation is exceedingly luxuriant, often extending to the tops of the mountains in dense forests. Woods valuable for shipbuilding and cabinet making are abundant, as are also those supplying gums, dyes, medicinal extracts, and turpentine. The chief minerals are copper, gold, asphalt, clays, coal, gypsum, iron, kaolin, lead, marble, salt, and zinc. Among the crops are rice, sugar cane, abaca or manila hemp, various species of palm, cotton, coffee, cinnamon, maize, and tobacco. Manufactures include cotton and silk tissues, cordage, plain and varnished leather, embroidery, wood and ivory carvings, mats, and carriages; boats, canoes, and large vessels are built. The capital of the Philippines is Manila. The chief cities with their estimated population are Manila, 623,362; Laoag, 42,046; Legaspi, 34,560; and Vigan, 19,285. For further information, including history, see PHILIPPINE ISLANDS.

Luzzatti, Luigi (1841-1927), Italian statesman and jurist of Jewish origin, was born in Venice. He was five times minister of the treasury, and succeeded in organizing the finances of Italy on a sound basis. Among his

works are *L'Abuso del credito e la finanza Italiana* (1889); *La libertà de conscience et de science* (1910); *Scienza e patria* (1916); *Sul filosofo dalmata Georgeo Politeo* (1919).

Lvoff, Alexei (1799-1870), Russian violinist and composer, was born in Reval. He became a general in the Russian army (1836), and at the same time conductor of the imperial court choir. His best known melody was adopted as the Russian national anthem to Shukovski's words (1883). He wrote violin concertos, operas, and numerous chants and tunes.

Lvoff, Prince George Eugenievich (1861-1925), Russian statesman, was influential in bringing about the first Duma, and as a member from Tula became a leader of the Constitutional Democratic Party. He was Prime Minister in the first revolutionary government and in the Coalition Cabinet.

LXX (abbreviation for *Septuaginta*), the Septuagint, the most ancient version of the Old Testament (Greek).

Lyall, Edna (1859-1903), pseudonym of ADA ELLEN BAYLY, English novelist, a native of Brighton. Her first published work, *Won by Waiting* (1879), met with little success, although *Donovan* (1882) and its sequel *We Two* (1884) at once attracted a large reading public. Other works include: *In the Golden Days* (1885); *Knight Errant* (1887); *A Hardy Norseman* (1889); *Derrick Vaughan* (1889); *Doreen* (1894); *Hope the Hermit* (1898); *Burgess Letters* (1902); *The Hinderers* (1902). Consult *Life* by Payne and by Escreet.

Lycanthropy, (Greek *lykos*, 'a wolf'; *anthropos*, 'a man'), is the peculiar power once attributed to certain people of assuming the character and the appearance of wolves. Such men were called 'lukanthropoi,' 'loups-garous,' 'werewolves' or 'men wolves,' 'turnskins,' and 'shape changers.' The term lycanthropy is not restricted to its literal meaning, but includes the power of assuming any animal shape—usually that of wolves, dogs, and bears. The origin of the belief in lycanthropy is very ancient and very obscure. It is well known that children and primitive peoples have the faculty of convincing themselves and their comrades that they have temporarily assumed the shape of animals, without the slightest actual change in their appearance. Crockett has made effective use of the werewolf superstition in his novel of *The Black Douglas*. Consult Baring-Gould's *Werewolves*.

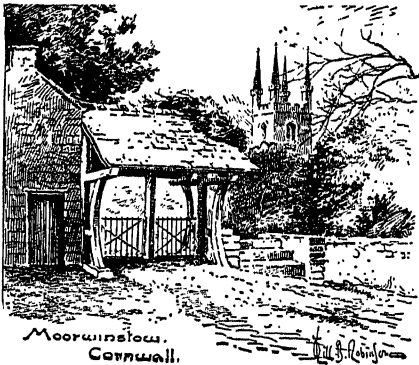
Lycaon, in ancient Greek legend, a king of

Arcadia, the son of Pelasgus, of whom it is related that he was the first civilizer of Arcadia, and that he was turned into a wolf because he offered human sacrifices to Zeus.

Lycaonia, ancient district of Asia Minor, became a separate province in 373 A.D., and now forms part of Konieh vilayet, Turkey.

Lycaste, a genus of tropical American orchids whose flowers are characterized by a transverse appendage at the middle of the lip. Many of the species are easily cultivated, and require but little heat.

Lyceum (Greek *Lukeion*), originally the name of a place in the immediate neighborhood of Athens, consecrated to Apollo Lycius, and noted for its shady wood and beautiful gardens, but particularly for its gymnasium. At the present day the name is variously applied to educational and literary institutions, especially to the French schools called *Ly-cées*. The term lyceum is frequently employed in America for an academy, association, or society. It may signify also the building in which the society meets.



Moornislow,
Cornwall.

Lyck Gates.

Lych Gate, or **Corpse Gate**, a covered, usually gabled churchyard gate, beneath which it was formerly customary for a bier to rest during the reading of the introductory part of the service.

Lychnis, a genus of plants characterized by flowers possessing a tubular, five-cleft calyx, and five long-clawed petals. They are herbaceous plants, generally perennial, and natives of temperate countries. The Ragged Robin is one of the most frequent ornaments of meadows and moist pastures in Europe, while Corn Cockle, with petals of a purplish red, is a conspicuous feature in many grain fields in the United States.

Lycia, a district on the southern coast of Asia Minor. The Lycians are prominent in the Homeric legend of the Trojan War. Many monuments and ruined buildings and other antiquities testify to the attainments of the Lycians in civilization and the arts.

Lycomedes, in ancient Greek legend, was the king of the Dolopians, in the isle of Scyros, to whose house Achilles was sent by his mother Thetis, in the disguise of a girl, to save him from the Trojan expedition. When Theseus sought his protection, Lycomedes treacherously hurled him over a rock.

Lycoperdon, or **Puff Ball**, a genus of gasteromycetous fungi, several species of which are edible in their young state. They mostly grow on the ground, and are roundish, gen-



Puff Ball (Lycoperdon Gemmatum).

erally without a stem, at first firm and fleshy, but afterward powdery within—the powder consisting of the spores. The peridium finally bursts at the top to allow the escape of the spores, which issue from it as very fine, dark brown dust.

Lycophron, (c. 260 B.C.), a celebrated grammarian and poet of the Alexandrian school, was a native of Chalcis in Eubœa. His only extant work is the *Alexandra* or *Cassandra*, a long monologue consisting of 1,474 iambic verses, in which Cassandra prophesies to Priam the destruction of Troy.

Lycopodium, a large, important, and widely distributed genus of plants commonly known as **Club Moss**, so called from the claw-like shape of the root, resembling a wolf's foot. There is only a superficial resemblance to the true mosses. The stems are thickly covered with leaves, are flowerless, and stand erect or trail along the ground.

Many of the species are ornamental plants. One variety is Stag Moss. Its fine, dust-like spores are the source of the inflammable *Lycopodium Powder*, or Vegetable Sulphur, which is used for artificial lighting on the stage, in the manufacture of fireworks, in dyeing processes, for medicinal purposes, and as an absorbent in surgery. 'Ground-Pine' is much used for Christmas decorations.

Lycurgus, a famous Spartan lawgiver, who is said to have lived about the beginning of the 9th century B.C. He was afterward worshipped as a god at Sparta.

Lycurgus, Athenian orator and statesman (c. 396-323 B.C.), who was a pupil of Plato and Isocrates, and who supported Demosthenes against Philip. Lycurgus was one of the leading statesmen at Athens, and was a most successful minister of the public revenue (338-326).

Lyda, a genus of Sawflies, hymenopterous insects whose larvæ are among the pests of the arboriculturist. Their pupal stage is passed in the soil, and they spin a web over leaves, within which web several larvæ may usually be found.

Lyddite, a high explosive used in the British service as a bursting-charge for shells. It is an intensely bitter crystalline solid of bright yellow color, and explodes only with difficulty under the influence of a powerful detonator, producing yellow fumes, as the explosion is usually incomplete.

Lydekker, Richard (1849-1915), English naturalist, educated at Trinity College, Cambridge. He visited the Argentine Republic, and made studies of the fossil and living animals, the results of which are set forth in his scientific works, of which he prepared a large number, including 10 volumes of catalogues of the fossils in the British Museum.

Lydgate, John (c. 1370-c. 1451), English poet, studied at Oxford, and entered the Benedictine monastery at Bury St. Edmunds. He endeavored to take up English verse where Chaucer dropped it, but his rank as a poet is far below that of his great master.

Lydia, anc. dist. of Asia Minor, in the center of the western end of the peninsula; bounded by Mysia on the n., Phrygia on the e., Caria on the s., and the Ægean Sea on the w. The coastland, however, was known as Ionia. The mountain range of Tmolus divides the district into two valleys. About 700 B.C., Gyges, a native Lydian, slew Candaules, the last Mæonian king; thenceforth the country was known as Lydia. It was in Lydia

that coins were first invented, probably about 700 B.C.

Lye is a term applied to the alkaline solutions of potassium and sodium hydroxides and carbonates. It is used in soapmaking, in neutralizing an acid, and in cleaning grease from other substances, such as metals to be plated.

Lyell, Sir Charles (1797-1875), British geologist, was born at Kinnordy, Forfarshire, Scotland. He visited the U. S. in 1841, travelling and lecturing, and again in 1845-6, in 1852, and 1858. The first volume of *The Principles of Geology* appeared in 1830, and two more volumes in subsequent years. His main idea was the uniformity of the operations of nature, and the sufficiency of the agent's action on the earth's surface at the present day to produce all the changes which were indicated by the rocks of the earth's crust. Hence Lyell became the foremost champion of the principle of 'uniformitarianism.'

Lygodium is a genus of handsome tropical ferns of twining habit. The stems are scandent, and the fronds are permanent, generally in old plants becoming so entangled as to form a mass of dense foliage. *L. palmatum* is the Hartford fern, formerly abundant in Connecticut, whence it ranges to Kentucky, its chief habitat.

Lyly, John (1553-1606), English dramatist, was born in Kent. His works include: *Romances, Euphues, the Anatomy of Wit* (1579, etc.); *Euphues and his England* (1580, etc.), both ed. E. Arber, 1868; ed. F. Landmann, 1887; plays, *Sapho and Phao* (1584); *Endimion* (1591; ed. G. P. Baker, 1894); *Love's Metamorphosis* (1601); *Collected Plays* (1632); ed. F. W. Fairholt, 1858; ed. R. W. Bond, with biography, 1902). See C. G. Child's *John Lyly and Euphuism* (1894), and Wilson's *John Lyly* (1905).

Lyman, Benjamin Smith (1835-1920), American geologist, and mining engineer, born at Northampton, Mass. In 1876, he surveyed the oil regions and mineral resources of Japan. He spent the greater part of 1886 in making a geological reconnaissance of the coal-fields of Colorado and northern New Mexico, and between 1887 and 1895 he was assistant state geologist of Pennsylvania. His most important publications are the following: *Telescopic Measurement in Surveying* (1868); *Character of the Japanese* (1885); *An Old Japanese Foot Measure* (1890); and *Japanese Swords* (1892).

Lyman, Chester Smith (1804-90), American astronomer, born at Manchester, Conn. In 1859 he was appointed professor of industrial mechanics and physics at Yale, and in 1881 was appointed to the chair of astronomy, which he held until 1889.

Lyman, Phineas (1716-74), American colonial soldier, born at Durham, Conn. In 1756 and again in 1758 he led Connecticut troops against the French, and in 1759 with 4,000 men aided in the capture of Ticonderoga and Crown Point. He took part in the expedition against Havana in 1762, and then went to England to collect the prize money due him and his companions.

Lyman, Theodore (1792-1849), American philanthropist, was born in Boston, Mass. He was mayor of Boston in 1834 and 1835, and in the latter year saved William Lloyd Garrison from the anti-abolitionist mob in that city. He established the State Reform School at Westborough.

Lyman, Theodore (1833-97), American naturalist, born at Waltham, Mass. Between 1865 and 1882 he was fish commissioner of Mass. and made the first important state experiments in the cultivation of food fishes. He represented the Ninth Massachusetts district in Congress (1883-85). His publications include: *Reports of the Commissioners on Inland Fisheries of Massachusetts* (1865-82); *Papers Relating to the Garrison Mob* (1870).

Lyme Regis, munic. bor., bathing and health resort, Dorsetshire, England, on south coast, $5\frac{1}{2}$ m. s.e. of Axminster. The town is picturesquely situated, and the district is of great geological interest on account of its 'blue lias' rocks.

Lymph is a clear, watery, albuminous fluid which bathes all the tissues of the body. It is faintly yellow or colorless, and is alkaline in reaction. Derived from the blood, it laves and nourishes the tissue elements, and returns to the circulation by the lymph vessels, bringing such pabulum as the tissues do not immediately require for their nutrition.

Lymphatics are the superficial and deep vessels and glands which carry lymph throughout the body. The vessels are tubular, and their walls have three thin coats—epithelial, muscular, and fibrous. Like veins, they have valves formed of semi-lunar flaps, which direct the onflow of the lymph. From their powers of absorption, the lymphatics are specially liable to be infected by a poison introduced into the tissues. Tubercle bacilli spread from gland to gland, and frequently lead to caseation and to suppuration. New

formations, if at all malignant, also advance by means of the lymphatics. Thus sooner or later a cancer of the breast involves the axillary glands.

Lynceus, in ancient Greek legend the name of two persons. (1.) A son of Ægyptus, who married Hypermnestra, one of the Danaides. (2.) A son of Apharcus and Arene, and brother of Idas, and renowned for his keen-sight.

Lynch, Charles (1736-96), American patriot, born on the present site of Lynchburg, Va. While preparing to set out with the militia in 1780 a Tory plot was discovered. Col. Lynch captured the conspirators and sentenced them to varying terms of imprisonment. At the close of the war his extra-legal action was questioned, but the act was legalized by the Virginia legislature. This is the most plausible explanation of the origin of Lynch Law. See Page, 'The Real Judge Lynch,' *Atlantic Monthly*, v. 88 (1901).

Lynch, John Joseph (1816-88), Canadian R. C. prelate, was born near Clone, Ireland, and after attending the Seminary of St. Lazare in Paris was ordained priest in Dublin in 1843. He served as professor at an Irish R. C. college, and in 1847 accompanied Bishop Odin to Texas. In 1848 he was driven north by fever, and became president of a Lazarist college in Mo. In 1856 he organized the Seminary of Our Lady of Angels at Niagara Falls, and in 1859 was consecrated coadjutor to the bishop of Toronto, succeeding as bishop in 1860, and greatly increasing the church organization in his diocese. In 1869 he visited Rome and was made archbishop of Toronto. He took an active interest in public questions, and frequently addressed his people on these subjects by word and pen.

Lynchburg, city, Campbell co., Va., 100 m. w. of Richmond. The chief products are shoes, cast-iron pipe, cotton goods, tanning extracts, ploughs, farm wagons, carts and vehicles, chewing and smoking tobacco, and cigars, cigarette machinery, etc. Tobacco is shipped in large quantities, and coal and iron are mined in the district. It is the seat of Randolph-Macon Woman's College (M. E., S.) and of Virginia Christian College (Dis.). Sweetbrier Institute is situated near here. During the Civil War it was a Confederate base of supplies. It was unsuccessfully attacked in 1864 by General Hunter; p. 44, 541.

Lynching, the act or practice by private persons of inflicting punishment for crimes or offenses without due process of law. It is at present practically synonymous with sum-

mary and illegal capital punishment at the hands of a mob. Although seven lynchings were committed in the United States in 1938 and none of the perpetrators arrested, the number of lynchings has gradually trended downward for many years. There were 231 lynchings in 1892; 1897, 158; 1903, 99; 1915, 67; 1921, 64; 1933, 28; 1935, 20; 1936, 9; 1937, 8; 1939, 3; 1940, 5; 1941, 4.

In 1938 an anti-lynching bill in Congress passed the House of Representatives but failed, by reason of a filibuster, to reach a vote in the Senate. Indications are that unless lynching ceases in the meantime, the matter will continue to be pressed before Congress until such a law is eventually passed. A number of states have already enacted such laws. For investigation on the subject consult *The Tragedy of Lynching*; a study of the 21 lynchings which took place in 1931, by Arthur Raper. Also consult reports of the National Urban League and the N.A.A.C.P.

Lyndhurst, John Singleton Copely, Baron (1772-1863), lord chancellor of England, was born in Boston, Mass. In the Wellington cabinet he attained great influence, and was in a measure responsible for the memorable decision in 1829 on the Catholic Emancipation question.

Lynn, city, Massachusetts, Essex co., on Massachusetts Bay. Manufactures include boots and shoes, electrical machinery apparatus and supplies, and foundry and machine shop products. Mucilage and paste, boxes, clothing, jewelry, soap, arc and incandescent lamps, and patent medicines are also manufactured in large quantities. The first settlement was made here in 1629; p. 98, 123.

Lynn Canal, inlet of the Pacific Ocean, Alaska, stretching north from Admiralty Island. It is the gateway to the Klondike region, and under the award of 1903 belongs to the United States.

Lynx, a genus of wild animals differing from the true wildcat in their greater length, short stumpy tails, tufted ears, and longer hair, especially around the face. In North America the genus *Lynx* is represented by two well marked types, the Canadian lynx and the bay lynx, also known as the red lynx or bob cat.

Lyons, David Gordon (1852-1935), American Orientalist, was born in Benton, Ala. From 1891 to 1922 he acted as Curator of the Harvard Semitic Museum (honorary curator, 1922). His special interest was Assyriology, and he became a leading authority on that subject.

Lyon, Mary (1797-1849), American educator, founder of Mount Holyoke College. was born in Buckland, Mass. She taught in various schools in New Hampshire and Massachusetts until 1834, when she undertook the work of founding a seminary where girls might receive an education at a nominal price. In the face of many discouragements she succeeded in gathering together enough money to start a school in South Hadley, Mass., under the name of Mount Holyoke Female Seminary, with about 80 pupils. Of this institution she was president until her death.

Lyonnesse, the land of the Arthurian legends, variously held to have been either the present Cornwall or a country stretching beyond it westwards and now covered by the sea.

Lyonia, a genus of North American and West Indian shrubs and trees belonging to the order Ericaceæ. Among the species are *L. ferruginea*, with white flowers in spring, and *L. ligustrina*, a hardy shrub found from New England to Virginia and southward.

Lyons, city and episcopal see, France, Department of the Rhône, stands at the confluence of the Saône and the Rhône; 240 m. s.e. of Paris and 170 m. north of Marseilles. It is the third largest city in France and is fortified on the n. and e. by a strong wall, 44 m. in circumference. The city forms a natural focus for commerce from n. and s., and canals connect both rivers with all the waterways of France. Lyons has numerous interesting and beautiful buildings, among which may be mentioned the cathedral of St. Jean (12th to 15th century); the archiepiscopal palace (15th century restored); the church of St. Martin d'Ainay. The silkworms of the Rhône valley, and the proximity of coal and iron (at St. Etienne, 36 m.), have made Lyons the first silk manufacturing town in France. Lyons is the stronghold of French Catholicism; p. 579, 763.

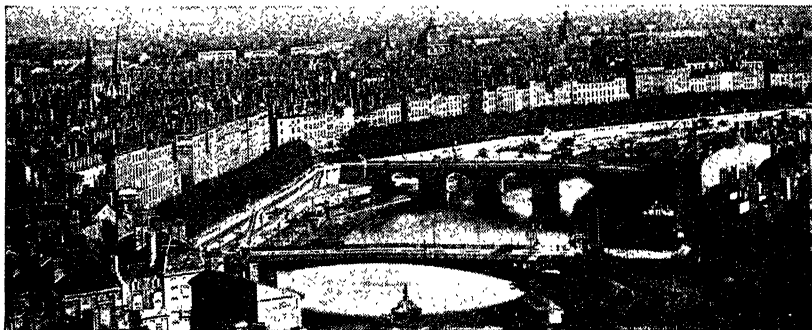
Lyons, Richard Bickerton Pemell (1817-87), first Earl Lyons; minister at Washington (1858). In such crises as the Trent difficulty (1861); during the Civil War in the U. S., when the Confederate commissioners to Europe, Mason and Slidell, were taken from the British steamer *Trent* by the American, Captain Wilkes, he showed firmness and discretion.

Lyra, an ancient constellation, situated on the borders of the Milky Way, near Cygnus. Its primitive association with an eagle or vulture survives in the name Vega, its largest star.

Lyre, an ancient musical stringed instrument of Eastern origin. The strings, varying in number from 3 to 18, were sounded by being struck with a plectrum held in the right hand, while the fingers of the left hand checked the vibrations of those strings required to be silent.

Lyre-birds are interesting passerine birds, found only in Australia, and remarkable for the two lyrate feathers found in the tail of the male.

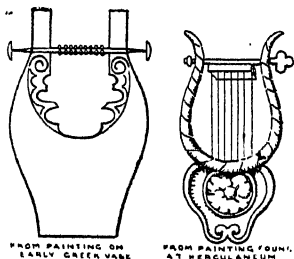
character of such Anglo-Saxon poetry as remains, and by the blotting out of English as a literary tongue for two centuries after the conquest. The fashion of singing to the lute, viol, or virginals endured right through the Elizabethan period, and largely determined the character of lyric poetry. The lyric of Thomas Campion, and the lyric scattered through the plays and masks of Shakespeare, of Ben Jonson, of Beaumont and Fletcher, is primarily intended to be sung. Mean-



View in Lyons, France.

Lyric is, according to its derivation, poetry sung to a musical accompaniment, as opposed to epic, spoken or recited poetry, and dramatic, which combines lyric and epic. Historically speaking, lyric began with communal or folk song, in which a group of workers in the common field or spinning-house, or of revelers at the common festival, expressed to the rhythms of toil or of the dance their com-

while more elaborate and artificial forms of lyric were introduced as a result of the study of European and classical poetry; Sir Thomas Wyatt and the Earl of Surrey, under Henry VIII., naturalized the sonnet.



Lyres.



Lyre Bird.

mon and primitive emotions. But so far as the spirit of lyric is concerned, the whole tendency of modern development has been to get away from folk-song, and to substitute for the expression of a communal emotion that of an emotion which is as personal and intimate as possible. The earlier history of English lyric is obscured by the non-lyrical

Edmund Spenser is mainly responsible for the Greek forms of ode and epithalamium, and for the pastoral convention so dear to the Elizabethan writers. Spenser is the dominant influence in English lyric until well

into the 17th century, when the example of John Donne, far less musical but more intellectualized, individual, and passionate, led to the formation of a group of court poets, among whom were Thomas Carew, Sir John Suckling, William Habington, Abraham Cowley, and Thomas Randolph. Somewhat aloof from these and with more affinities to the earlier school, stand John Milton, Andrew Marvel, and Robert Herrick. A group of religious lyrists includes the Anglican George Herbert and Henry Vaughan, and the Catholic Richard Crashaw. The transition from the imaginative lyric of Donne to the witty lyric of the restoration is represented by Edmund Waller; and the latter itself by Sir Charles Sedley, the Earl of Rochester, and John Dryden. Thereafter lyric disappears from English literature, until at the end of the 18th century the voices of William Collins and William Blake herald the second great lyrical period, which has extended from Wordsworth, Coleridge, Byron, Shelley, and Keats to the writers of our own day.

See general histories of literature and poetry. For selections see F. T. Palgrave's *Golden Treasury of Songs and Lyrics*.

Lys, riv., France and Belgium, rises in dep. Pas-de-Calais, and flows n.e. through Nord to form the boundary between France and Belgium. It then continues n.e. through W. and E. Flanders, and after a course of 100 m. falls into the Scheldt at Ghent.

Lysander, famous Spartan commander, was a son of Aristocritus, of the royal Heraclid house. He became prominent first in the year 407 B.C. in the Peloponnesian Wars, when he was sent out as navarch, or commander of the fleet. About 403 B.C. he seems to have formed an idea of changing the constitution of Sparta by making the monarchy elective instead of hereditary—of course with the view of obtaining it for himself—but he failed. During the war with Thebes (395 B.C.) Lysander fell in battle before Haliartus.

Lysias (c. 459-c. 380 B.C.), one of the ten Attic orators, was born at Athens. He lived prosperously with his brother Polemarchus in Athens until 404 B.C., when their wealth attracted the attention of the Thirty Tyrants. Polemarchus was killed, while Lysias just escaped with his life, losing most of his fortune; retaining enough, however, to aid in the restoration of the democracy (403 B.C.). He devoted the rest of his life to writing speeches for pay. They are of great interest for the light which they throw upon Athenian legal procedure and the life of the time,

and are remarkable for their perfection of style.

Lysimachia, a genus of flowering plants, order Primulaceæ, mostly natives of the northern temperate regions. The commonest cultivated species is *L. nummularia*, the money-wort, which thrives in damp, shady places.

Lysimachus (360-281 B.C.), one of the generals of Alexander the Great, got the government of Thrace (323 B.C.), the title of king (306 B.C.), and with Seleucus defeated Antigonus at Ipsus (301 B.C.). He fell in battle against Seleucus on the plain of Corus (281 B.C.).

Lysippus, famous Greek sculptor, was a contemporary of Alexander the Great, who ordered that no one except Lysippus should carve his statue.

Lyte, Henry Francis (1793-1847), Scottish hymn-writer, born at Edman, near Kelso. Among his best-known hymns are *Abide with me*, and *Praise, my soul, the King of Heaven*.

Lythraceæ, a natural order of plants, trees, herbs, and shrubs, most of which are natives of tropical America.

Lythrum (loosestrife), a genus of plants belonging to the order Lythraceæ. They are characterized by having a cylindrical calyx with 12 parts, and a corolla of six petals. Among the garden species are *L. Graefferi*, from the south of Europe, often grown in greenhouses as a hanging-basket plant; and the hardy native, *L. alatum*, with erect, brilliant purple flowers.

Lytle, William Haines (1826-63), American soldier and poet, born in Cincinnati, O. He entered the Civil War as colonel of the 10th Ohio, and became brigadier-general of volunteers in November. His *Poems* with a *Memoir* by Venable were published in 1894. His best-known effort is 'I am Dying, Egypt, Dying.'

Lytton, Edward George Earle Lytton Bulwer, Baron Lytton (1803-73), novelist, dramatist, and politician, was born in London. The first work to bring him into prominence was his novel *Pelham* anonymously published in 1828. The *Last Days of Pompeii* (1834) and *Rienzi* (1835), showed an unsuspected power of sustaining human interest in archaeological and historical fiction. The flow of fiction from his pen continued from 1841, its most popular examples being *Zanoni* (1842), *The Last of the Barons* (1843), *Lucretia* (1847), *Harold* (1848), *The Caxtons* (1849), *My Novel* (1853), *What will he*

do with it? (1859), *A Strange Story* (1862), *The Coming Race* (1871), *The Parisians* (1873), and *Kemelin Chillingly* (1873). He published several volumes of verse. The chief of these are two fairly successful satires, *The New Timon* (1846) and *Saint Stephen's* (1860); a romantic epic, *King Arthur* (1848-9); and *The Lost Tales of Miletus* (1866).

Lytton, Edward Robert Bulwer, First EARL LYTTON (1831-91), son of the preceding statesman and poet, was born in London, and educated at Harrow. He won a literary reputation by his poems under the pseudonym of 'Owen Meredith.' Previously to his suc-

ceeding (in 1873) to his father's title of Baron Lytton, he had had diplomatic experience first as attaché, and subsequently as secretary of legation, with his uncle, Sir Henry Bulwer at Washington, from 1849 to 1852. He was created Earl of Lytton in 1880. He published his father's unfinished biography (1883) *Glenaveril*, a narrative poem (1885); and *After Paradise* (1887). He was appointed (1887) ambassador at Paris, where he died suddenly. As a poet, his work is more distinguished by brilliancy than by any deeper quality. He is at his best in his lightest vein, as in *Fables in Song*, or the posthumously published *King Poppy* (1892).

M, the thirteenth letter of the English alphabet, is believed to have been ultimately derived from the Egyptian hieroglyphic symbol of an owl. When the symbol was taken over into Phœnician, it received a form resembling ripples, and hence the letter was given the name *mem*, 'the waters,' which became *mu* in Greek.

M., a thousand (mille); marquis; member; monsieur.

M.A., Master of Arts.

Maartens, Maarten (1858-1915), the pen name of JOOST MARIUS WILLEM VAN DER POORTEN-SCHWARTZ, Dutch novelist, born in Amsterdam. In 1889 he produced his first book, *The Sin of Joost Avelingh*, which proved an immediate success as a delineation of Dutch manners. His works include *The Price of Lis Doris* (1909); *Harmon Pools* (1910); *Eve* (1912). All of Maarten's books were written in English, most of them being later translated into Dutch.

Maastricht, town, Netherlands, capital of the province of Limburgh. The Church of St. Servatius was founded in the 6th century. South of the town are the tuff quarries of Petersburg. Until 1871, Maastricht was one of the strongest fortresses in Europe.

Mab, Queen, in the poetry of the 16th century, is queen of the fairies and consort of Oberon.

Mabie, Hamilton Wright (1846-1916), American writer and lecturer, was born in Cold Spring, N. Y. In 1879 he joined the editorial staff of *The Christian Union*, afterward *The Outlook*, of which he was associate editor (1884-1916) with Dr. Lyman Abbott. His works include: *Norse Stories Retold from the Eddas* (1882); *Writers of Knickerbocker New York* (1912); *American Ideals, Character, and Life* (1913). He also compiled the 'Every Child Should Know' Series.

Mabuse, Jan, properly **Yenni Gossaert** (c. 1470-c. 1537), Flemish painter, was born in Maubeuge (Mabuse). His earlier pictures are in the style of the early Flemish school. His later works embrace three classes—subjects from Greek mythology, as *Nep-*

tune and Amphitrite and *Danaë*; portraits, as of the children of King Christian II. of Denmark (about 1528), of a princess of Portugal, and of Jean Carondelet (1517); and religious subjects, including *St. Luke Painting the Madonna*, *Christ in Agony*, *Adam and Eve*, and several Madonnas.

Mac, a prefix in modern Irish and Gaelic signifying 'son'—as MacDonald, son of Donald.

Macabebe, pueblo, Pampanga province, Luzon, Philippines; 30 m. n.w. of Manila. at the head of the delta of the Rio Grande de la Pampanga. There is considerable river trade; p. 16,000.

Macadam, John Loudon (1756-1836), inventor of the process of road making known as 'macadamizing,' was born in Ayr, Scotland. He came to America in 1770. He was forced to return to England in 1783. In 1810 he made experiments in road building, and concluded that small, hard, broken stones should be used in layers gradually consolidated by the passage of traffic.

McAdie, Alexander George (1863-1943), Am. aerographer, was born in New York City. In 1913 he became professor of meteorology at Harvard and director of the Blue Hill Observatory. In 1918 he was made lieutenant-commander in the U. S. Naval Reserve Force, in charge of the aerographic section of the naval aviation service. *Rainfall of California* (1914); *Winds of Boston* (1918); *Principles of Aerography*.

McAdoo, William (1853-1930), American public official, was born in Rathmelton, County Donegal, Ireland. He came to the United States in 1861, and studied law in Jersey City. He was Police Commissioner of New York City in 1904-05, and became chief city magistrate in 1910.

McAdoo, William Gibbs (1863-1941), Am. statesman and railroad official, was born near Marietta, Ga., son of William G. McAdoo. After practising law in Tennessee, he removed to New York, in 1892, where he continued the practice of his profession. He conceived the Hudson River tunnel system,

organized the company which built it, and was its president from 1902 to 1913; was a delegate to the Baltimore convention in 1912; and was vice-chairman of the Democratic National Committee and acting chairman during the greater part of the campaign of 1912. He was appointed Secretary of the Treasury by President Wilson, March 5, and took the oath of office March 6, 1913; and was appointed Director General of Railroads, December 26, 1917, when the government took over the operation of the railroads.

McAdoo was an outstanding contender for the Democratic Presidential nomination in 1924, but his candidacy was deadlocked with that of Alfred E. Smith and the choice went to John W. Davis. McAdoo returned to active political life in 1932 and was elected U. S. Senator from California. He threw the support of John N. Garner to Franklin D. Roosevelt at a dramatic moment in the 1932 Presidential convention. The action turned the tide and Roosevelt was nominated. He was divorced by the former Eleanor Wilson, daughter of Woodrow Wilson, in 1934, and in 1935 married Miss Doris Cross, a nurse in the Public Health Service. He was defeated for the Senatorial nomination in 1938.

McAllister, Ward (1827-95), American society leader, was born in Savannah, Ga. He became by marriage connected with many prominent families, and developed into a leader of New York society. The term 'The Four Hundred' is due to his remark that the New York smart set consisted only of four hundred persons.

McAneny, George (1869-), City official, New York City. President of the Borough of Manhattan (1910-14), president Board of Aldermen (1914-16), City Controller (1933). Served as chairman of the advisory board for city planning, president of Regional Plan Association. Received Beaux Arts Medal from French Government (1915) for services to city planning, and in 1931 was made Chevalier of the Legion of Honor.

Macao, Portuguese colony and seaport town on a peninsula of Hiang-shan Island, off the coast of Kwang-tung, China, at the western entrance of the Canton River; 40 m. from Hong-kong; p. 167, 175.

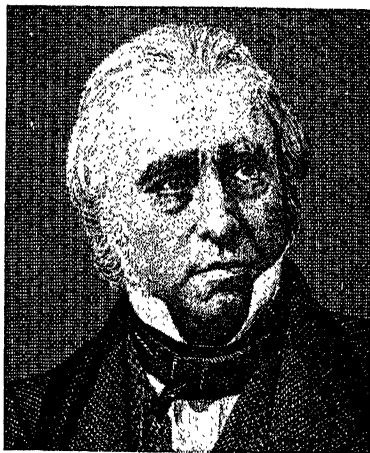
Macaque, a genus of monkeys belonging to the sub-family Cercopithecinae. There are 17 recognized species, all Asiatic except the *Macacus Inuus* or Barbary ape.

Macaroni, a preparation usually of wheat, made in Italy, France, the United States, China, Japan, and Palestine. China has also rice,

bean, and wheat-and-rye macaronis; Japan bean, buckwheat, and seaweed macaronis; and Italy, whole wheat and chestnut-wheat-flour macaronis. The most common material is, however, hard wheat of the durum or other variety cultivated for the purpose.

MacArthur, Douglas (1880-), U. S. army officer, was born in Little Rock, Ark., son of Lt. Gen. Arthur MacArthur; was graduated from West Point in 1903; brigadier general in World War I; major general, 1925; general, 1930; military adviser to the Philippine government, 1935-37; was again named full general, 1941. After the enemy attack on Hawaii, in December, he succeeded in delaying the Japanese advance in the Philippines; then he was ordered to go to Australia, where he assumed command of all Allied armies in the southwest Pacific. By skilful strategy he won back the Pacific islands and by the end of 1944 was back in the Philippines. Following the surrender of Japan in 1945 he entered Tokyo and assumed command there.

Macassar Oil, a thick, yellowish oil obtained from the seed of the East Indian kumum tree (*Schleichera trijuga* Willd), and used by the natives for illuminating, cooking, and medicinal purposes. It was formerly exported in considerable quantities for use as a hair tonic.



Thomas Babington Macaulay.

Macaulay, Thomas Babington, First BARON (1800-59), English historian, was born in Rothley Temple, Leicestershire. In 1825 he began to contribute his famous essays to the *Edinburgh Review*, the first being the essay on 'Milton.' In 1830 he was

elected to Parliament for Calne. His first speech on the Reform Bill (March, 1831) put him in the front rank of orators. He was elected M.P. for Edinburgh in 1839, soon afterward entering the Cabinet as Secretary of State for War.

The Lays of Ancient Rome were published in 1842. Three years before Macaulay had begun *The History of England from the Accession of James II.* His rejection by Edinburgh in 1847, on account of his support of the Maynooth grant, practically closed his political career. November, 1848, saw the publication of the first two volumes of his *History*. The third and fourth volumes of his *History* were given to the world in 1855. A posthumous volume, bringing it down to the death of William III., was edited by his sister, Lady Trevelyan, in 1861. He was buried in Poets' Corner, Westminster Abbey. Consult Sedgwick's *Essays on Great Writers* (1903); Morley's *Literary Essays* (1906); *Marginal Notes by Lord Macaulay*, edited by Sir G. O. Trevelyan (1907); Trevelyan's *Life and Letters* (2 vols.; new edition, 1909).

McAuley, 'Jerry' (1839-84), lay missionary to outcasts, was born in Ireland, and came to New York in 1852. He grew up a criminal, and in 1857 was sent to Sing Sing Prison on a false charge of highway robbery, and was pardoned in 1864. In 1872 he reformed, and the same year opened a mission in Water Street, New York City, a neighborhood infested with criminals. In 1912 a modern, sanitary building was erected on the site of the old structure in Water Street. In 1882 he began a similar work in West Thirty-second Street in what is called the 'Jerry McAuley Cremorne Mission.' After the death of the founder, his work was continued by Samuel H. Hadley and by John H. Wyburn, who is the present superintendent.

Macaw, the name of certain South American parrots, belonging to the genus *Ara*, and to other related genera. All are gorgeously colored, and possess a peculiarly harsh and screaming voice. See **PARROT**.

Macaw Tree, also called **Gru-Gru**, a palm, native to South America and the West Indies. Its fruit yields an oil, sweetish, violet scented, and yellow, largely exported as palm oil, and much used in soap manufacture.

Macbeth, hereditary *mormaer* or ruler of Moray, murdered Duncan, king of the Scots, near Elgin (1040), and succeeded him on the throne. The fables immortalized by Shakespeare's genius are derived from Holinshed's *Chronicle*.

McBurney, Charles (1845-1913), American surgeon, born in Roxbury, Mass. He was consulting surgeon to President McKinley after the latter was shot. He was also consulting surgeon to the New York, Presbyterian, St. Luke's, St. Mark's, and other hospitals.

McCabe, James Dabney (1842-83), American author, was born in Richmond, Va. He published, during his lifetime, hundreds of short stories and poems, and about twenty books, chiefly popular histories, biographies, and children's works.

Maccabees, a famous Jewish family, descendants of Mattathias, though the more accurate term for the family is Hasmonæans or Asmonæans, derived from Hashmon, the name of the great-grandfather of Mattathias. They were leaders of the popular rebellion against Syria and the upper classes of the Jews themselves, who had adopted Greek life and customs. Consult Streane's *Age of the Maccabees*; Conder's *Judas Maccabeus and the Jewish War*; Hanael's *Judas Maccabeus*; Henderson's *Age of the Maccabees* (1907).

Maccabees, Books of the. Of the five apocryphal writings embraced under his name, I. and II. Maccabees are accepted as canonical by the Roman Catholic Church, and III. Maccabees also by the Greek Church.

I. **MACCABEES** deals with the period 175-135 B.C., and narrates the origin and progress of the Jewish revolt against Syria, and the exploits of Judas, Jonathan, and Simon. II. **MACCABEES** begins its history one year previous to that of I. Maccabees, but covers only fifteen years. III. **MACCABEES** relates two incidents—*viz.*, Ptolemy IV. Philopator's attempt to desecrate the sanctuary (217 B.C.), and his attempt to destroy the Jews. IV. **MACCABEES** has for its theme 'the supremacy of pious reason over the passions,' and is a philosophical prelection, influenced by Greek thought, especially Stoicism, and illustrated from Maccabæan history as found in II. Maccabees. V. **MACCABEES** contains a summary of Jewish history covering practically the last two centuries B.C., and has been compiled from I. and II. Maccabees and Josephus.

Maccabees, Knights of the Modern, a fraternal beneficiary order, founded in 1881, with headquarters at Port Huron, Mich. It has one grand camp and 1,300 subordinate camps, with a total membership of 65,000.

Maccabees, Ladies of the Modern, the first fraternal beneficiary order for women founded in 1886. It has one great hive and

924 subordinate hives, with a membership of 47,789.

Maccabees of the World, Knights of the, a fraternal beneficiary organization founded in 1883, and incorporated under the laws of Michigan, with headquarters at Detroit, Mich.

Maccabees of the World, Ladies of the, a fraternal beneficiary order for women, founded in 1892. It has three great hives and 2,881 subordinate hives, with a total membership of 167,756.

McCall, John A. (1849-1906), American insurance official, was born and educated in Albany, N. Y. In 1887 he became comptroller of the Equitable Life Assurance Society, and in 1892 president of the New York Life Insurance Company. The Armstrong insurance investigation of 1905 led to his resignation early in 1906, and he died two months later.

McCalla, Bowman Hendry (1844-1910). At the time of the Boxer uprising in China (1900) he commanded the landing party from the United States Asiatic Fleet, which, with the British Admiral Seymour's party, tried to set free the foreign legations at Peking. He was made rear-admiral in 1905.

McCarthy, Denis Florence (1817-82), Irish poet, was born in Dublin. In 1864 he settled in London. He wrote poems for *The Nation* and *The Irish Catholic Magazine* (1845).

McCarthy, Justin (1830-1912), Irish writer and legislator, was born in Cork. In 1868 he came to the United States, and spent three years travelling and lecturing, during which time he was a member of the editorial staff of the *New York Independent*. He revisited the United States in 1886. He was for seventeen years a member of the British Parliament, for the last six of which (1890-6) he was chairman of the Irish Home Rule Party. Consult his *Reminiscences* (1899), *Irish Recollections* (1911), and *Our Book of Memories; Letters to Mrs. Campbell-Praed* (1913).

McCarthy, Justin Huntly (1860-1936), dramatist and historian. His novels include: *The King Over the Water* (1911); *The Fair Irish Maid* (1911); *A Health unto His Majesty* (1912); his histories, *Outline of Irish History*, *Short History of the United States*, and his plays, *The Highwayman* (1891); *If I Were King* (1901) and *The Proud Prince* (1903)—these two presented in the United States by E. H. Sothern.

MacChesney, Clara Taggart (1861-

1928), Am. genre painter, born in Brownsville. She received medals at Chicago in 1893, Buffalo in 1901, and St. Louis in 1904; and the Dodge Prize of the National Academy of Design in 1894. Among her pictures are *Retrospection*; *Portrait of George Pardee*; *A Good Story*; *The Discovery*.

McClellan, George Brinton (1826-85), American soldier, was born in Philadelphia, Pa. At the beginning of the Civil War McClellan was commissioned major-general of Ohio volunteers, and in May, 1861, was placed in command of the Department of the Ohio, with the rank of major-general of regulars. In March 1862, after the President had long vainly urged him to make a forward movement, McClellan transferred the Army of the Potomac to the Yorktown Peninsula, and began what is known as the Peninsula Campaign against Richmond. In August, 1864, McClellan was nominated by the Democratic Party as its candidate for President of the United States. He was defeated by Lincoln, who received 2,200,000 of the 4,000,000 popular votes, and 212 out of 233 votes in the Electoral College. From 1870 to 1872 he was chief engineer of the department of docks in New York City.

McClellan, George Brinton (1865-1940), Am. educator and public official, was born in Dresden, Saxony. He was treasurer of the New York and Brooklyn Bridge (1889-92); president of the New York board of aldermen (1893); and served four terms as a member of Congress (1895-1903). From 1904 to 1909 he was mayor of New York City. In 1906 he was made honorary chancellor of Union College. From 1908 to 1910 he was Stafford Little lecturer on public affairs at Princeton University, and since 1911 has been professor of economic history there. He has published *The Oligarchy of Venice* (1904).

Macclesfield, municipal borough, Cheshire, England; 12 m. s.e. of Stockport. It is the chief silk-manufacturing center in England.

McClintock, Sir Francis Leopold (1819-1907), British admiral and Arctic explorer, was born in Dundalk, Ireland. He served in four Arctic expeditions, and on the fourth (1857) ascertained the fate of Franklin. In 1859 he published *The Fate of Sir John Franklin*.

McCloskey, John (1810-85), American Roman Catholic prelate, was born in Brooklyn. He was educated at Mount St. Mary's College, Emmitsburg, Md.; was ordained in 1834; and after three years' study in Rome and Paris became pastor of St. Joseph's

Church in New York. In 1841 he was made the first president of St. John's College, Fordham, N. Y. In 1844 he was appointed coadjutor to Bishop Hughes of New York, and in 1847 became the first bishop of the new diocese of Albany. After 17 fruitful years in Albany, he succeeded (1864) Hughes as archbishop of New York. In 1875 he was created a cardinal.

McClure, Alexander Kelly (1828-1909), American journalist and legislator, was born in Perry co., Pa. From 1873 to 1901 he exercised great influence as editor-in-chief of the *Philadelphia Times*. From 1904 until his death he was prothonotary of the supreme court of Pennsylvania. He published: *The South* (1886); *Abraham Lincoln and Men of War Times* (1892); *Recollections of Half a Century* (1902).

McClure, Samuel Sidney (1857), American publisher, was born of Scotch-Irish parentage, in Frocess, County Antrim, Ireland. As a boy he came to the United States with his parents, who settled in Illinois. He was graduated from Knox College in 1882; and in 1884 established in New York City the McClure Syndicate, to buy manuscripts of authors and sell them for simultaneous publication in several newspapers. In 1893 he founded *McClure's Magazine*, and in 1899, with John H. Phillips, organized the publishing house of McClure, Phillips & Co. In 1906 he bought Mr. Phillips' interest in the house.

McCord, George Herbert (1848-1909), American artist, was born in New York City. His landscapes and marine paintings, chiefly of scenes in Florida and on the northeast coast, are in the leading public and private collections of the United States.

McCormack, John (1885-1945), Irish tenor vocalist, was born in Athlone. He first appeared on the English operatic stage in 1907, as Turridu in *Cavalleria Rusticana*, at Covent Garden, London, and since then has filled many important engagements in the United States, Great Britain, and Italy. In 1919 he became a naturalized citizen of the United States.

McCormick, Cyrus Hall (1809-84), American inventor, was born in Walnut Grove, Va. In 1831 he constructed his first reaping machine, patented in 1834, and frequently improved. In 1847 he removed to Chicago, and established there the works now known as the McCormick Harvesting Machine Co. His inventions have played an important part in the agricultural development of the U. S.

McCormick, Robert Sanderson (1849-1919), American diplomat, was born in Rockbridge co., Va. In 1902 he was appointed ambassador to Austria-Hungary; from 1902 to 1905 he was ambassador to Russia; and from 1905 to 1907 ambassador to France.

McCormick Theological Seminary, a Presbyterian divinity school in Chicago, Ill., established in 1829 as the Theological Department of Hanover College, Hanover, Ind. In 1886 it received its present title in recognition of the support and endowment given by Cyrus H. McCormick.

MacCracken, Henry Mitchell (1849-1918), American educator, was born in Oxford, O. In 1884 he became vice-chancellor and professor of philosophy at New York University, and was chancellor from 1891 to 1910. During his administration new buildings were erected on University Heights.

MacCracken, Henry Noble (1880-), American educator, was born in Toledo, O. He was instructor in English at Harvard (1908-10), and professor of English at Smith College (1913-14). He has been president of Vassar College since 1915.

MacCracken, John Henry (1875-), American educator and publicist. He was instructor and assistant professor of philosophy at New York University (1896-9); president and professor of philosophy of Westminster College, Mo. (1899-1903); syndic and professor of politics at New York University (1903-15) and president of Lafayette College (1915-26).

McCrary, George Washington (1835-90), American legislator, was born in Evansville, Ind. He drafted the law under which the United States judiciary was reorganized.

McCulloch, Hugh (1808-95), American financier, was born in what is now Kennebunkport, Me. In May, 1863, at the solicitation of Salmon P. Chase, Secretary of the Treasury, he accepted the newly created office of controller of the currency. In March, 1865, he succeeded William P. Fessenden as Secretary of the Treasury, an office which he held until the expiration of Johnson's Presidency in March, 1869. In October, 1884, he again became secretary of the Treasury, but retired the following March.

McCullough, John Edward (1837-85), American tragedian, was born in Blakes, Londonderry, Ireland. When 16 years old he went to the United States. In 1866-8 he acted with Edwin Forrest, whom he made his model.

McCutcheon, George Barr (1866-1928),

American novelist, brother of John T. McCutcheon, was born in Tippecanoe co., Ind. His principal work is *Graustark*.

McCutcheon, John Tinney (1870-), American cartoonist, brother of George B. McCutcheon, was born near South Raub, Ind. In 1903 he joined the staff of the Chicago Tribune, making another trip to Africa in 1909-10. He was with the Belgian and German armies in 1914, and in France and the Balkans in 1915-6. Many of his cartoons have been published in book form.

MacDonald, George (1824-1905), Scottish poet and novelist, was born in Huntly, Aberdeenshire. In 1872-3 he made a lecture tour in the United States. His published works include *St. George and St. Michael* (1876); *The Marquis of Lossie* (1877); *Sir Gibbie* (1879); *Castle Warlock* (1882). He also published several charming stories for children, among which are *At the Back of the North Wind* (1871), *The Princess and the Goblin* (1872).

MacDonald, James Ramsay (1866-1937), British political leader, was born in Lossiemouth, Scotland. He was educated at a board school and early identified himself with the Socialist movement, becoming prominent as a writer and organizer. From 1906 to 1918 he was Labor member of Parliament for Leicester, and in 1911 became leader of his party, resigning in 1914 because of his pacifist views and opposition to the World War. In 1922 he was again elected to Parliament and in 1924 became premier of England, the first member of the Labor Party to achieve that distinction.

The Labor Government of 1924 was in a minority and was driven from power in the late fall of that year after the publication of an alleged letter from the Soviet Commissar of Foreign Affairs, Gregory Zinovieff, to British Communists, suggesting the formation of Bolshevik cells in British military forces. The letter was regarded as a forgery. MacDonald, besides being Prime Minister, held the Foreign portfolio and was Chancellor of the Exchequer in this Cabinet. He was returned to power on June 8, 1928, succeeding Stanley Baldwin. The Laborite attempt to govern England collapsed again in August, 1931, MacDonald retaining the Prime Ministership, however, in a coalition National Government, with Stanley Baldwin at his side as Lord President of the Council. In 1935 MacDonald retired as Prime Minister, relinquishing the office to Baldwin and assuming the post of Lord President of the Council.

On April 21st, 1933, in response to an invitation by President Roosevelt he arrived in New York, leaving April 26. British-American problems were discussed in Washington where MacDonald was the President's guest. No conclusion was arrived at concerning the war debts. But largely as a result of these discussions it was decided to call together the World Economic Conference on June 12, 1933.

His writings include, *Parliament and Revolution* (1920); *The Foreign Policy of the Labor Party* (1923).

MacDonald, James Wilson Alexander (1824-1908), American sculptor, was born in Steubenville, O., and studied in St. Louis and New York. Among his statues are those of *Edward Bates*, in Forest Park, St. Louis (1876), of *Fitz-Greene Halleck*, in Central Park, New York City, and of *General Custer*, at West Point. He made busts of Washington, from Houdon's original, for Prospect Park, Brooklyn.

Macdonald, Sir John Alexander (1815-91), Canadian statesman, was born in Glasgow, and was taken to Canada in 1820. He was an advocate of the federation of the British North American colonies, and when the Dominion of Canada was created in 1867 he became its first Premier. He held office till 1873, came back into power in 1878 as a protectionist, and remained in office till his death. He was one of the signers, for Great Britain, of the Treaty of Washington (1871).

MacDonald, John B. (1844-1911), American contractor, was born in Ireland, and was brought to New York as a boy. Among his most important constructions are the railroad tunnels and viaduct of the New York Central Railroad in New York City; the West Shore Railroad from Weehawken to Buffalo, and particularly that part of the New York subway which was completed in 1904.

MacDonald, William (1863-1938), American scholar and author, was born in Providence, R. I. From 1918 to 1920 he was associate editor and foreign correspondent of *The Nation*.

McDonnell, Charles Edward (1854-1921), American Roman Catholic bishop, was born in New York City. He was educated at St. Francis Xavier's College, New York, and at the American College in Rome. He was ordained priest in 1878, and after holding charges in New York City became secretary to Cardinal McCloskey (1884-5) and to Archbishop Corrigan (1885-92). In 1892 he

was consecrated bishop of Brooklyn. At his death in 1921 he was succeeded by the Rt. Rev. Thomas E. Molloy.

McDonough, Thomas (1783-1825), American naval officer, was born in New Castle co., Del. During the War of 1812 he served first on the *Constitution*, but in September, 1812, was given command of the fleet on Lake Champlain. On Sept. 11, 1814, in Plattsburg Bay, his fleet of 14 vessels, with 86 guns and about 850 men, shattered a British fleet consisting of 16 vessels, with 95 guns and about 1,000 men, under Capt. George Downie. As a reward, Congress voted him the commission of captain (then the highest rank in the navy) and a gold medal. Vermont gave him an estate overlooking the scene of the battle.

MacDougal, Daniel Trembly (1865-), American botanist, was born in Liberty, Ind. In 1899 he became assistant director of the New York Botanical Garden, and in 1905 director of the department of botanical research in the Carnegie Institution at Washington, D. C. He has been noted for his investigations of the physiology, heredity, and evolution of plants. Among his contributions to science are *Botanical Features of North American Deserts* (1908); *Water Balance of Succulent Plants* (1910); *Conditions of Parasitism in Plants* (1910); *Alterations in Heredity Induced by Ovarial Treatments* (1911); *Organic Response* (1911).

McDougall, Alexander (1731-86), American soldier, was born on the island of Islay, Scotland. He removed to New York with his father in 1755. While the Assembly was wavering in its opposition to the crown, he wrote an address entitled 'A Son of Liberty to the Betrayed Inhabitants of the Colony,' for which he was imprisoned 23 weeks. He was a delegate from New York to the Continental Congress in 1781-82, and again in 1784-85. He was a member of the State senate in 1783 and at the time of his death.

MacDougall, Walter Hugh (1858-), American artist, was born in Newark, N. J., and received no regular schooling. In 1876 he began work as an artist, and was among the first to prepare cartoons for the daily papers. He is the author of *The Hidden City* (1886); *No. 11*. (1890); *History of Christopher Columbus* (1892).

MacDowell, Edward Alexander (1861-1908), American composer and pianist, was born in New York City. In 1881 he became head of the piano department at the Darm-

stadt Conservatory. He returned to the United States in 1888, and settled in Boston, where he taught with success, and augmented his musical reputation by composing and playing in concerts. In 1896 he was appointed professor of music at Columbia University, from which position he resigned in 1904 to devote himself to composition. In 1908 a collection of *Verses* was issued, consisting of the introductory mottoes to his instrumental music. A MacDowell pageant was given in 1910 at the composer's former home in Peterborough, N. H. As a concert performer MacDowell was admirable, especially in the interpretation of his own works, but the composer soon overshadowed the pianist. His music, as a whole, is impressionistic in method, and displays the poetic qualities of fervor, richness, and delicacy of imagination which were his heritage from his Celtic forebears; and a depth of feeling which is prevented by a wholesome restraint and directness of style from degenerating into sentimentality. He ranks at the head of American composers. Consult Gilman's *Edward MacDowell* (1906).

MacDowell, Irvin (1818-85), American soldier, was born in Columbus, O. He was put in command of the Army of the Potomac on May 27. With this army, in obedience to the wishes of the President, he began in the middle of July the first 'On to Richmond' march. The Confederate forces were encountered at Manassas, more popularly known as Bull Run. For a time the Union troops drove the enemy back; but the arrival of reinforcements sent by General Johnston turned probable defeat for the Confederate Army into victory. In 1864 he was relieved of his command. He thereupon demanded a court of inquiry, which found that certain charges made against him were baseless. His distinguished services at the battle of Cedar Mountain gained for him the brevet rank of major-general in the regular army (1865).

Macduff, thane or earl of Fife, who, according to tradition, succeeded in defeating Macbeth at the battle of Lumphanan (1057), and assisted in placing Malcolm Canmore on the throne. Consult Shakespeare's *Macbeth*.

McDuffie, George (1790-1851), American legislator, was born in Columbia co., Ga. He was a member of the legislature in 1818; and from 1821 to 1834 a member of Congress. He was the champion of Nullification and wrote the 'Address to the People of the United States' issued by the Nullification convention. He was governor of South Carolina

(1834-6) and U. S. Senator (1843-6). His speeches in Congress were marked by grace and lucidity.

Mace, formerly a weapon of war, in use in Europe as late as the 16th century, consisting of a staff about 5 ft. long, with a heavy knob at the end. It is now used as a symbol of authority by certain judges, magistrates, and high official persons. The mace is the symbol of authority of the Speaker of the U. S. House of Representatives.

Mace, the large branched aril of the nutmeg, is of a deep orange or scarlet color, and of a fleshy consistence when fresh. It is commonly sold as a spice, in the dry state, when it takes on a dull yellowish color.

Macedonia, or **Macedon**, a country to the north of ancient Greece. On the accession of Philip (359 B.C.) it reached down to Mt. Olympus in Thessaly. The inhabitants were of Greek race, but the Greeks regarded them as an alien people. The monarchy became strong through Philip's organization of a regular standing army; and from his time until its conquest by Rome (168 B.C.), Macedonia's history is part of that of Greece. Macedonia has become notorious in recent years as the scene of revolts against Turkish rule. In 1903 several bloody encounters occurred; in the vilayet of Monastir alone, 119 villages were destroyed, and 30,000 refugees fled from Macedonia to Bulgaria. The district was thereafter policed by a gendarmerie composed of representatives from five powers, but with little result. In December, 1905, the powers made a naval demonstration against Turkey to force their scheme of financial control in Macedonia. Complications arise from the rivalries among Serbians, Bulgarians, Albanians, and Greeks, who are severally striving, by means of schools and propaganda, to foster a spirit of race patriotism. In 1908 the Reval program for further reforms, backed by Great Britain, was withdrawn after the establishment of the constitutional monarchy.

In the first Balkan War (1912-13), the Greeks and Serbians sent armies into Macedonia and Salonica was occupied. The division of Macedonian spoils between Bulgaria and her allies was the cause of the second Balkan War, and Macedonia was again the center of the stage. By the treaty of Bucharest, 1913, Macedonia was divided between Greece and Serbia but before much could be accomplished in the way of improving a region long neglected, the Great War broke out and in 1915 the Allied troops landed at Salonica, which became the base of their op-

erations in Macedonia. Bulgaria was eventually routed and surrendered and by the peace terms of 1919 Macedonia was divided between Greece and Yugoslavia.

McEwen, Walter (1860-1943), American artist, was born in Chicago. For his portraits and his pictures of Dutch life he received many medals at the Salon and other exhibitions.

Macfadden, Bernarr (1868-), American physical culturist, publisher, was born in Mill Springs, Mo. He published several newspapers and magazines; wrote *Encyclopedia of Physical Culture*.

Macfarren, Sir George Alexander (1813-87), English musical composer and writer, was born in London. In 1830 he produced his first important orchestral work, a symphony. *Chevy Chase* (written in one night, 1836) was produced at Leipzig by Mendelssohn (1843); *May Day* (cantata) in 1857, Costa conducting; *Robin Hood*, his greatest opera, in 1860, in which year he became blind.

McFaul, James Augustine (1850-1917), American Roman Catholic bishop, was born near Larne, County Antrim, Ireland. He was chancellor (1890-2), vicar-general (1892-4), and in 1894 was consecrated bishop of the diocese of Trenton. He took an active part in educational and civic problems as related to the Catholic Church in the United States.

McFee, William (1881-), author, was born in London. After an apprenticeship as mechanical engineer he went to sea as chief engineer. His first writing was done in 1922. Among his works are *Command* (1922); *Sailors of Fortune* (1929); *North of Suez* (1930); *The Harbormaster* (1932).

McGee, Anita Newcomb (1864-), American physician and writer, was born in Washington, D. C. She married W. J. McGee in 1888. She studied medicine at Columbian (now George Washington) University, was graduated in 1892, and began the practice of medicine in Washington, where she was appointed attending physician to the Woman's Hospital and Dispensary (1893-6). From August, 1898, to the end of 1900 she was acting assistant surgeon, U. S. Army, and superintendent of the Army Nurse Corps division of the Surgeon General's office. She has written and lectured extensively throughout the United States, and has received many decorations.

McGee, William John (1853-1912), American geologist and anthropologist, was born in Dubuque co., Ia. From 1907 to 1912 he was U. S. Commissioner of Inland Water-

ways and an expert in the Department of Agriculture. He was also editor of the *National Geographical Magazine* for several years, and of the *Bulletin* of the Geological Society of America.

McGiffert, Arthur Cushman (1861-1933), American theologian and author, was born in Sauquoit, N. Y. In 1893 he accepted the chair of church history at Union Theological Seminary, New York City, and in 1917 became president of that institution, retiring in 1926. His works include *The Rise of Modern Religious Ideas* (1915); *The God of the Early Christians* (1924).

McGill, James (1744-1813), Canadian philanthropist, was born in Glasgow, Scotland, and emigrated to Canada at an early age. His principal benefaction was in connection with McGill University, for the foundation of which he bequeathed £10,000 and lands, the increase in whose value subsequently made it the wealthiest educational institution in Canada.

McGill College and University, an institution of learning in Montreal, Canada, incorporated by royal charter in 1821, and named for its founder, Hon. James McGill, who bequeathed land and £10,000 for its establishment. The college opened in 1829 with faculties of arts and medicine, but suffered under financial and administrative difficulties until an amended charter was secured in 1852. The educational work of the university is carried on in McGill College, the Royal Victoria College for Women in Montreal, and Macdonald College, Ste. Anne de Bellevue. In July, 1911, Sir William Macdonald made to the university a gift of land on the slope of the mountain adjoining Mountroyal Park. Here Macdonald Park and a fine stadium were constructed, the name of the stadium being changed in 1919 to the Percival Molson, in memory of Percival Molson, who gave \$75,000 for its erection and who was killed in the Great War.

MacGillcuddy's Reeks, mountains in County Kerry, Ireland, on the shores of the Lakes of Killarney.

McGillivray, Alexander (c. 1740-93), Creek Indian chief, was born within the present limits of Alabama. His father was a Scotch trader and his mother a half-breed (French and Indian) woman of royal stock. He entered into negotiations with the Spanish government, received a commission with the rank of colonel, and refused to treat with the American authorities. In 1790 he visited New York to consult with Washington, and

was appointed agent for the United States with the rank and pay of brigadier-general. At the same time he kept up his Spanish connections, playing one government against the other.

McGlynn, Edward (1837-1900), American clergyman, was born in New York City. He became (1866) pastor of St. Stephen's Church, in New York City, where he gained a reputation as an able administrator and eloquent preacher. His opposition to parochial schools brought him into disfavor with the clerical authorities, and when he adopted the single-tax theories of Henry George, openly advocating them in the New York mayoralty campaign of 1886, though prohibited to do so, he was suspended and then excommunicated. His excommunication was removed in 1892, and he was rector of a church at Newburgh, N. Y., from 1895 until his death. He was one of the founders and president (1887) of the Anti-Poverty Society.

MacGrath, Harold (1871-1932), American novelist, was born in Syracuse, N. Y., and was educated in the public schools of that city. He has been engaged in journalism since 1890. Among his works are *The Man on the Box* (1904); *The Goose Girl* (1909); *Deuces Wild* (1913); *The Luck of the Irish* (1917); *The Ragged Edge* (1922).

McGuffey, William Holmes (1800-73), American educator, was born in Washington co., Pa. He was successively president of Cincinnati College and of Ohio University. After 1845 he was professor of moral philosophy and political economy at the University of Virginia. His *Eclectic Readers* and spelling books were long in vogue in American schools.

Machado y Morales, Gerardo. See **Cuba**.

Machærodus, a formidable carnivorous animal, with canine teeth from 8 to 12 in. in length, larger than those of any other known animal. It is well represented in Pleistocene strata all over America and Europe.

Machiavelli, or Macchiavelli, Niccolò (1469-1527), Italian writer, was born in Florence. In 1519 he gained the favor of the Medici, who conferred some minor posts on him, which he held while writing the *Istorie Fiorentine*. Three of Machiavelli's great works may be said to supplement each other. *The Principe* (1532) deals with the founding of a new state, and suggests as model the duchy of Romagna, as founded and governed by Cæsar Borgia. Machiavelli's own politi-

cal ideal was a republic such as Rome had been, and in the *Discorsi sopra la Prima Deca di T. Livio* (1531) he uses Livy as a peg on which to hang and by which to illustrate his own favorite theories. The *Arte della Guerra* (1521) upholds the idea of an armed people, and of the infantry as the main strength of the army, thus again going back to Rome and her legions as a model. His writings were issued in two volumes, with an introduction by Cust, in 1905. Consult Villari's *Niccolò Machiavelli e i suoi Tempi* (Eng. trans.); Foster's *Machiavelli* (1900); Stearns' *Napoleon and Machiavelli* (1903); Dyer's *Machiavelli and the Modern State* (1904); Balfour-Browne's *Essays Critical and Political* (1907); Morley's *Critical Miscellanies* (vol. iv., 1908).

weight balances a counterweight on a long-arm beam, which instantly diverts the flow of material to another hopper. The hydraulic ram is an automatic machine working upon the principle of the inertia of running water. Governors on steam engines, injectors, thermostats, and many similar contrivances are examples of the widespread application of the automatic principle to modern mechanism.

Mack, Julian William (1866-1943), American jurist, was born at San Francisco; educated at Harvard; professor of law at Northwestern University (1895-1902); University of Chicago (1902-11); on various government boards in World War I. He was U. S. Circuit Judge (1911-43).

McIlvaine, Charles Pettit (1799-1873),



McGill University.

Machine Guns. See **Guns, Artillery.**

Machines, Automatic. A large number of machines may be termed automatic, in that, being set in motion with an adequate supply of motive power, they perform a series of operations without further intervention from the man in charge. In the manufacturing industries the adoption of automatic machinery has been rapid because of the enormous increase in output and reduction in number and cost of workers possible by its use. Weighing appliances afford the most perfect examples of automatic machines, as in them no external power is required, and no supervision after the first adjustment. Automatic weighing machines separate a continuous supply of material into a succession of equal weights, at the same time registering the number of weighings. The material to be weighed flows into a hopper, which discharges its contents through the bottom into the package when the

American Protestant Episcopal prelate, was born in Burlington, N. J. He served as professor of ethics and chaplain at West Point (1825-27), as rector of St. Ann's Church, Brooklyn, N. Y. (1827-32), and in 1832 was consecrated bishop of Ohio. He was also president of Kenyon College at Gambier (1832-40).

Mackay, John William (1831-1902), American capitalist, was born in Dublin, Ireland, and was brought to New York in 1840. He joined the gold rush to California, and discovery of silver in the Bonanza mines in the Sierra Nevadas, 1872, laid the foundation for Mackay's great fortune. In 1884, with James Gordon Bennett, he established a cable line from the United States to England.

MacKaye, James Steele (1842-94), American dramatist, was born in Buffalo. Two of his early plays *Monaldi* and *Marriage* (1871-3), met with scant success in New York City; but *Hazel Kirke*, with which he

opened the Madison Square Theatre, in 1880, ran for nearly a year.

MacKaye, Percy (1875-), American poet and dramatist, son of James Steele MacKaye, was born in New York City, and after 1904 devoted himself to writing, producing his own plays and masques, and lecturing on the theatre. His works include: *A Thousand Years Ago* (1914); *Caliban*, written for the New York City celebration of the Shakespeare Tercentenary (1916); *The Modern Readers' Chaucer* (with J. S. P. Tatlock, 1912); *The Life of Steele MacKaye* (1927); *The Gobbler of God* (1928); Kentucky mountain folk plays, a number of operas, essays, and volumes of poetry.

McKean, Thomas (1734-1816), American patriot, was a member of and later president of the Continental Congress. He voted for the Declaration of Independence, his signature having been affixed later. From 1777 to 1799 he was chief justice of Pennsylvania, and from 1799 to 1808 governor of the State.

McKeesport, city, Pennsylvania, Allegheny co., at the junction of the Monongahela and Youghiogheny Rivers. There are large steel tube works, brick yards, tin plate and glass works, and blast furnaces; natural gas is abundant, and a large trade in coal and lumber is carried on; p. 55,355.

McKees Rocks, borough, Pennsylvania, Allegheny co., on the Ohio River. Its chief manufactures are iron and steel, lumber, nuts and bolts, enamel, chains, and forgings; p. 17,021.

McKelway, St. Clair (1845-1915), American editor, was born in Columbia, Mo. He was admitted to the bar (1866), but devoted himself to newspaper work. He was correspondent of the *New York Tribune* (1863-5), associate editor of the *Brooklyn Eagle* (1870-78), editor of the *Albany Argus* (1878-85), and editor of the *Brooklyn Eagle* (1885-1915). He was a regent, vice-chancellor (1900-13), and chancellor (1913) of the University of the State of New York, a director of the American Social Service Association, and a member of the National Institute of Arts and Letters.

McKendree College, a Methodist Episcopal institution at Lebanon, Ill., founded in 1828.

McKenna, Joseph (1843-1926), American jurist, was born in Philadelphia. He went to California in 1855, was member of Congress from 1885 to 1892. In 1897-8 he was U. S. Attorney-General in McKinley's Cabinet, and

in 1898 became an Associate Justice of the U. S. Supreme Court.

Mackensen, August von (1849-1945), German cavalry general, was born in Saxony, and received a university training at Halle. At 20 he entered the army, was lieutenant of reserves during the Franco-German war, lieutenant in the regular army (1873), adjutant of cavalry (1876-8), and lieutenant-colonel (1878-80). During 1880-7 he was on the general staff of various bodies, and in 1894 he was with the Life Hussars as lieutenant-colonel. In 1898 he was made aide-de-camp in attendance to the Kaiser and in 1899 was raised to the hereditary nobility. In the Great War of Europe he was given leading command on the Central Eastern front. At the close of hostilities, November, 1918, Von Mackensen was in command of German troops in Roumania, and attempting to get back reached Hungary, where he was taken prisoner. He was later interned at Salonica, and at length released by the Council of Paris (1919).

Mackenzie, Sir Alexander Campbell (1847-1935), Scottish musical composer and violinist, born in Edinburgh. His works comprise *The Rose of Sharon*, an oratorio (1884); *Veni, Creator* (1891); besides songs, part-songs, and anthems.

McKenzie, Alexander Slidell (1803-48), American naval officer and author. In 1842, while he was in command of the *Somers*, a mutinous plot was discovered, and by recommendation of a council of officers three of the culprits were hanged. One of them was the son of John C. Spencer, Secretary of War, and a storm of denunciation arose. McKenzie was exonerated, however, both by a court of inquiry and by a court-martial. He published several books, including *A Year in Spain* (1829); *Life of Stephen Decatur* (1846).

Mackenzie, William Lyon (1795-1861), Canadian journalist and political agitator, was born in Dundee, Scotland. He emigrated to Upper Canada (now Ontario) in 1820, and in 1824 began the publication of the *Colonial Advocate* in Queenstown. In this paper he strongly opposed the government. In 1834 he became the first mayor of Toronto. An address practically amounting to a declaration of independence was published in his new paper, *The Constitution*, on Aug. 2, 1837, and in November a provisional government was declared. In a trifling skirmish at Montgomery's Farm, December 7, the

revolutionists were defeated and Mackenzie fled to the United States. With a band of American sympathizers, he occupied Navy Island, but the attempt failed, and he was convicted of violating the neutrality laws, and imprisoned in Rochester for more than a year. Mackenzie went to New York, secured a clerkship in the New York Custom House, and while there copied a large number of private letters from prominent politicians found among the effects of Jesse Hoyt, a former collector. These were published with bitter comments as *Life and Opinions of Benjamin F. Butler and Jesse Hoyt* (1845), and *Life and Times of Martin Van Buren* (1846). Mackenzie returned to Canada under the general amnesty in 1849. See Lindsey's *Life* (1862).

Mackenzie River, British North America, rises as the Athabasca, near Mount Brown in the Rocky Mountains, and flows for 680 m. till it reaches Lake Athabasca, which it leaves as the Great Slave River. It then flows n.w., receiving the Rivers Peace and Finlay, and falls into Great Slave Lake. Issuing from this on the w., it is known as Mackenzie River, is about 1,000 m. long, and flows n.w. into Mackenzie Bay. The mouth is closed with ice from October to June.

Mackerel (*Scomber scombrus*) belong to a family of bony fishes, the Scombridæ. The common mackerel ranges from the s. of Norway to the Canary Islands, and throughout the Mediterranean; and on the American side, from Cape Hatteras to Newfoundland. It spawns in May, June, and July, approaching toward the coast from the open sea; the migrations of the mackerel are not well understood, and the movements of the shoals may be erratic, so that the fishery is liable to great fluctuations. The mackerel fishery of the world ranks from the cod and herring in importance. Spanish mackerel (*Scomberomorus maculatus*) are found along the coasts of the United States, and are highly esteemed as food.

McKibben, Chambers (1841-1919), Amer. soldier, served with distinction in the Civil War. He took part in the Spanish-American War of 1898 as brigadier-general of volunteers; and was military governor of Santiago de Cuba. He served as commander of the department of Texas in 1899-1902.

McKim, Charles Follen (1847-1909), American architect. He established himself as an architect in New York City in 1872, and went into partnership with William R. Mead and Stanford White. The firm created

a veritable renaissance in American architecture. The splendid station of the Pennsylvania Railroad in New York City was erected after his designs. McKim was actively interested in architectural education. He endowed fellowships in architecture in Harvard and Columbia Universities, and founded the American Academy in Rome. See ARCHITECTURE.

Mackinac Island, in the strait of the same name. It is about 9 m. in circumference, rocky and wooded, and abounds in features of romantic interest. Fort Mackinac, on a cliff above the village of Mackinac, commands the strait. It was much visited by the early French explorers, and was the seat of an important post of the Astor Fur Co. The name was originally Michilimackinac.



Arch Rock, Mackinac Island.

McKinley, Mount, the highest peak of the North American Continent, in Alaska; height 20,464 ft. It rises abruptly from a low plain and is perhaps the steepest of the great mountains of the world. It presents on all sides a succession of glaciers overhanging great cliffs.

McKinley, William (1843-1901), 24th President of the United States, was born in Niles, Ohio. After distinguished service in the Civil War, Major McKinley (as he was usually called) began the study of law at Youngstown, O. He attended the Albany (N. Y.) Law School in 1866-67, was admitted to the bar the latter year, and began to practise at Canton, O., where he thereafter lived. In 1869 he was elected prosecuting attorney of Stark co. as a Republican, overcoming a normal Democratic majority, and began to take a lively interest in politics. He canvassed the state for his old colonel, R. B.

Hayes, then a candidate for governor of Ohio on an anti-greenback platform in 1875, was himself elected to the U. S. Congress in 1876, and was twice re-elected. In 1890 he advocated the passage of the Sherman Silver Purchase Act. He was a frequent speaker upon various questions, but his chief reputation was won as a member of the Committee on Ways and Means, to which he was appointed in 1880, and of which he became chairman in 1889. Here he was instrumental in framing the highly protective tariff act of 1890 which bears his name, and of which he was the chief advocate.

After his retirement from Congress he was elected governor of Ohio in 1891, and was re-elected in 1893. During his first term he became financially embarrassed, chiefly through indorsing notes for friends. These debts were paid by several of his friends among the capitalists and business men of the state, and this fact gave rise to much criticism, as some of these men were interested in franchises and other matters coming before the legislature. Meanwhile Mr. McKinley's reputation outside the state had been growing. For months before the convention of 1896 an aggressive movement in his favor was headed by his close friend, M. A. Hanna, and at St. Louis, June 16, 1896, he was nominated, on the first ballot, on a platform advocating high protective duties and opposing free coinage of silver. A new feature of the campaign was the organization of many expeditions to his home at Canton. From his veranda he made about 300 speeches to nearly a million persons. At the election he received 271 electoral votes to 176 for W. J. Bryan, though his plurality in the popular vote was only 601,854. During his first term an unusual number of grave problems presented themselves. The chief events were the passage of the Dingley Tariff, the Spanish-American War, followed by the acquisition of Porto Rico and the Philippines, the annexation of Hawaii, the Boxer troubles in China, the preparation of Cuba for independence, and the development of a system of colonial administration. President McKinley was unanimously renominated by the Republican convention June 25, 1900, and was again elected over W. J. Bryan. While holding a reception in the Music Hall of the Pan-American Exposition at Buffalo, N. Y., Sept. 6, 1901, he was shot by an anarchist, Leon Czolgosz, and died Sept. 14.

McKinley Bill, a tariff bill which became a law by Pres. Harrison's signature on

Oct. 1, 1890, and which received its name from William McKinley, then chairman of the Ways and Means Committee of the House of Representatives. Its official title was, "An act to reduce the revenue and equalize duties on imports, and for other purposes." Though the free list was extended somewhat, the bill was nevertheless an essentially high protectionist measure and the former duties on many articles were increased. The bill embodied two new features—the grant of a bounty to domestic sugar producers and the provision for commercial reciprocity, the President being empowered to make reciprocal treaties with such countries as should refrain from levying a heavy tax on American imported goods in consideration of free importation into the U. S. of sugar, molasses, tea, coffee, and hides.

McLaglen, Victor (1886-), motion picture actor, born in England. On the outbreak of the war he joined the British forces. After his discharge in 1919 he entered motion pictures, finally coming to the U. S. His best performances include *What Price Glory*, *The Cockeyed World*, *Under Two Flags* and *The Informer*. He won the 1935 Academy of Motion Picture Award.

MacLaren, Ian. See **Watson, John**.

McLane, Louis (1786-1857), American politician and diplomatist, was U. S. Senator from 1827 to 1829, and from 1829 to 1831 minister to England. He was recalled by President Jackson to become Secretary of the Treasury. From 1837 to 1847 he was president of the Baltimore and Ohio R. R., and in 1845 again became minister to England, but retired with the settlement of the Oregon difficulty in 1846.

McLane, Robert Milligan (1815-98), American diplomat; sat in Congress 1847-51; and was commissioner to China, 1853-6, and minister to Mexico, 1859-60. He was elected to Congress from 1879 to 1883. In the latter year he was elected governor of Maryland, but resigned in 1885 to become minister to France, serving until 1889.

McLaren, William Edward (1831-1905), American bishop. He was rector of a church at Cleveland, O., until 1875, when he became bishop of Illinois.

McLaughlin, Andrew Cunningham (1861), since 1906 has been professor at the University of Chicago. He organized and directed the Bureau of Historical Research in the Carnegie Institution of Washington (1903-05), and was President of the American Historical Association, 1914.

Maclaurin, Richard C. (1870-1920), Scottish-American educator, born in Lindean, Scotland. From 1907 to 1909 he was professor of mathematical physics at Columbia University, New York, until his election to the presidency of the Massachusetts Institute of Technology, a position he held until his death. His writings include many technical monographs and contributions to scientific reviews.



William McKinley.

Maclay, Edgar Stanton (1863-1919), Amer. author, on the editorial staffs of the *New York Tribune* and *Sun*. In 1900 he was appointed to a position in the Brooklyn Navy Yard. A passage in his *History of the U. S. Navy* (1894-1902), making charges against Admiral Schley's conduct at Santiago in 1898, was one of the causes which led to the Schley court of inquiry in 1901, and to the author's dismissal.

Maclay, William (1737-1804), American patriot, was born in New Garden, Chester co., Pa. In 1789 he was elected to the U. S. Senate, drawing the short term ending in 1791. He strongly opposed Federalist policies; attacked Washington for interference with legislation, and helped to crystallize Republican sentiment. His *Journal* gives an

interesting account of the proceedings of the first Congress.

MacLean, George Edwin (1850-1938), Amer. educator, minister of the Memorial Presbyterian Church at Troy, N. Y., from 1877 to 1881. In 1895 he was elected chancellor of the University of Nebraska, and was president of the University of Iowa from 1899 to 1911.

McLean, John (1785-1861), American jurist, was born in Morris co., N. J. With his father he settled in Warren co., Ohio, in 1797. After studying law in Cincinnati, he sat in the U. S. Congress as a War Republican from 1813 to 1816, and in the latter year became a member of the Ohio supreme court. He became commissioner of the land office in 1822, and was Postmaster-General from 1823 to 1829, serving with great efficiency. In 1829 he became a member of the U. S. Supreme Court, where two of his opinions were particularly important; the first in regard to unlawful military combinations against a friendly power, and the second his dissenting opinion in the Dred Scott Case.

MacLeish, Archibald (1892-), poet; appointed Librarian of Congress, 1939.

McLellan, Charles (1865-1916), Anglo-American playwright. Under the pseudonym of HUGH MORTON he wrote the libretti of many plays as *The Bell of New York*, *In Gay New York*, and *The Telephone Girl*.

McLeod, Archibald Angus (1848-1902), American railroad financier, was born in Quebec, Canada. He became president of the Reading Railroad. He leased the Lehigh Valley and Jersey Central systems, forming a powerful coal combination. He acquired interests in the New York and New England and the Boston and Maine lines, and endeavored to make the Poughkeepsie bridge a connecting link between these systems and the coal roads. His consolidation of these systems, however, resulted in the Reading Railroad passing into the hands of receivers.

MacLeod, Fioan. See **Sharp, William.**

McLeod, John (1788-1849), Canadian explorer, was born in Stornoway, Scotland. He entered the employ of the Hudson Bay Company in 1811, developed trade throughout the Northwest and with the Hawaiian Islands, and rose to high office in the company. He conducted many exploring expeditions, and was the first known white man to cross the continent from Hudson Bay to the Pacific Coast.

Macles, or Twin Crystals. Certain crystals tend to grow in groups of two or more,

associated together according to definite laws. Those which have certain faces parallel in the different crystals, but others not, are known as macles, or twins, or compound crystals.

Maclure, William (1763-1840), American geologist, was born in Ayr, Scotland. In 1796 he went to the United States, and made the first geological map of the country (1817), thus earning the title of 'Father of American Geology.' He bequeathed his library and maps to the Philadelphia Academy of Natural Sciences, with \$20,000 for a building for them.

MacMahon, Marie Edmé Patrice Maurice de (1808-93), duke of Magenta, and marshal and president of France. He was governor-general of Algeria from 1864 to 1870, when at the beginning of hostilities with Prussia he was given the command of the first army corps. On his return to Paris in 1871 he took the city from the Communists and two years later succeeded Thiers as president of the French republic; he resigned the presidency in 1879.

McMahon, Martin Thomas (1838-1906), American soldier and jurist, was graduated (1855) from St. John's College, Fordham, N. Y.; studied law, and from 1868 to 1869 was U. S. minister to Paraguay. From 1872 to 1885 he was receiver of taxes for New York City, and from 1885 to 1889 U. S. marshal for the southern district of New York. He served in the New York assembly and senate from 1890 to 1895, and as a judge of General Sessions after 1895.

McMaster, John Bach (1852-1934), American educator and historian, was born in New York City. He was graduated from the College of the City of New York in 1872. From 1873 to 1877 he was engaged in civil engineering, and became professor of American history at the University of Pennsylvania, and in 1920 professor emeritus. In 1905 he was president of the American Historical Association. He was the author of a monumental *History of the People of the United States*. He also wrote *Benjamin Franklin as a Man of Letters* (1887); *The United States in the World War*; besides school histories of the United States and many articles.

Macmillan, a well-known publishing house, was founded by the brothers Daniel (1813-57) and Alexander Macmillan (1818-96), Scotsmen. An American branch was opened in New York in 1869, and was incorporated in 1892 as a separate business under the title The Macmillan Company.

MacMillan, Donald Baxter (1874-), American explorer, was born in Provincetown, Mass. After several years of teaching, he was assistant to Commander Peary in the Polar Expedition of 1908-9. He was commander of the Crocker Land Expedition in



Macmonnies' Statue of Nathan Hale in City Hall Park, New York City

1913-17, and commanded the Hudson Bay Expedition of 1920 and the Baffin Land Expedition of 1921-22. In June 1923 he made his eighth polar voyage, sailing from Wiscasset, Me., in his schooner, *Bowdoin*. He returned in September 1924, confirming the report that glaciers are moving southward, and

bringing valuable information in regard to radio, as well as collections of ethnological, geological, and geographical interest. Among other expeditions was the Labrador Aerial expedition of 1931. He wrote *With Peary on the Polar Sea* (1933), and other books, and was awarded the Kane gold medal, 1927, for 'daring exploration and scientific research.'

Macmonnies, Frederick (1863-1937), American sculptor, was born in Brooklyn, N. Y. His *Nathan Hale* (now in City Hall Park, New York) received a medal in Paris. During 1892-3 he worked on the huge fountain for the World's Columbian Exposition at Chicago. Among his statues are the famous *Bacchante* (in the New York Metropolitan Museum of Art); the colossal figure of *Victory* on the battle column at West Point; and the groups for the Memorial Arch in Prospect Park, Brooklyn.

MacNeil, Hermon Atkins (1866-), American sculptor, was an instructor at Cornell University, then went to Paris and studied. He assisted in the sculptural work for the Columbian Exposition, and turned attention to American Indian themes.

McNutt, Paul Voories (1891-), American public administrator, born in Franklin, Ind., educated at Indiana University and Harvard. He taught law at Indiana University; was governor of Indiana, 1933-37; U. S. High Commissioner to Philippines, 1937-39; and became Federal Security Administrator, 1939. He was an outstanding candidate for the 1940 Democratic nomination for President. He was made chairman of the War Manpower Commission, 1942; was reappointed High Commissioner to the Philippines, 1945.

Macomb, Alexander (1782-1841), American soldier, was born in Detroit, Mich. In January, 1814, he was made brigadier-general in charge of the northern frontier, and in September, 1814, commanded the land forces at Plattsburg, N. Y., in the Battle of Lake Champlain. At the reorganization of the army in 1821 he was retained as colonel and chief engineer, and from 1828 until his death was major-general and general-in-chief of the army.

Macon, city, Georgia, county seat of Bibb co., at the head of navigation on the Ocmulgee River. It occupies a peculiarly advantageous site, near the center of the State, on both sides of the river, which affords abundant water power. Macon is the seat of Mercer University (Bapt.), Mount de Salles Academy (R. C.), and Georgia Academy for

the Blind. It is also of special importance as a concentration point for cotton, and a market in the heart of a rich agricultural district, being especially noted as the center of the famous Georgia peach belt. It has foundries and lumber mills. Macon was settled about 1820; p. 57,865.

Macon (ancient *Matisco*), city, France, capital of the department Saône-et-Loire, on the Saône River. The river is here crossed by an ancient bridge with twelve arches and there is an old Cathedral (St. Vincent's), now in ruins. The town has a large trade in Burgundy wines, for which it is celebrated. It was the birthplace of Lamartine; p. 18,427.

Macon, Nathaniel (1758-1837), American legislator. As a State senator (1781-5) he vigorously opposed the adoption of the U. S. Constitution on account of its centralizing provisions.

Macpherson, James (1736-96), Scottish author, known for his 'translations' of Ossian's *Fingal* and *Temora*. These 'Ossianic' poems were to a great extent Macpherson's own. He was buried in the Poet's Corner, Westminster Abbey.

McPherson, Aimee Semple (1890-1944), evangelist, born in Canada, began her career as a gospel speaker in girlhood, settling in Los Angeles in 1918. There she built the Angelus Temple Church of the Four-Square Gospel. She was divorced by David L. Hutton, Jr., in 1934. Her first husband was Robert Semple, a missionary who died in China. Divorce ended her marriage to Harold McPherson, a grocery clerk. Services in Angelus Temple are attended by thousands of persons every week. In 1935, the evangelist conducted a revival meeting in Shanghai.

McPherson, James Birdseye (1828-64), American soldier, was born in Sandusky co., O. He was graduated at West Point, first in the class of 1853; taught engineering there the next year; was stationed at the New York Harbor defences in 1854-7, and from 1857 to 1861 was engaged on the defences of San Francisco. At the outbreak of the Civil War he was stationed at Boston Harbor. In the Georgia campaign he was second in command to Sherman, and was killed while reconnoitring near Atlanta (July 22, 1864).

McQuaid, Bernard John (1823-1909), American Roman Catholic prelate, was born in New York City. He was graduated, 1843, from St. John's College, Fordham, and held pastorates in New Jersey, where he erected several churches and founded and was pres-

ident of Seton Hall College and Seminary (1858-68). For a time he was rector of the Newark Cathedral. In 1868 he was consecrated first bishop of Rochester.

Macquarie Islands, a group of uninhabited islands in the Southern Pacific Ocean, about 800 m. s.e. of Tasmania, to which they belong.

Macquarie River (native, *Wambool*), New South Wales, Australia, is formed by the junction of the Fish and Campbell Rivers, and is a tributary of the Darling or Barwan. It gives its name to the great Macquarie swamp through which it flows for 30 m.

Macready, William Charles (1793-1873), English actor and manager. He made a tour of the United States in 1826, and again in 1843-4. In 1849, while he was filling an engagement in New York, the theatre was mobbed by partisans of Edwin Forrest.

McReynolds, James Clark (1862-), American jurist, in 1913 became Attorney-General in President Wilson's Cabinet, and on Aug. 19, 1914, was appointed an Associate Justice of the U. S. Supreme Court. One of his notable utterances from the bench was in dissent from the gold clause decision in 1935, when he declared that the majority of the court, in affirming abrogation of the gold clause in government obligations, had upheld 'Nero in his worst form' and 'swept away the Constitution,' opening the way to 'impending legal and moral chaos that is appalling.' Resigned, 1941.

Macrinus, (164-218 A.D.), emperor of Rome 217-18 A.D., was severely defeated by the Parthians; his troops mutinied and defeated him near Antioch; he fled to Chalcedon, but was betrayed and executed.

Macrozamia, a genus of evergreen Australian plants, of the order Cycadaceæ. They bear ovoid cones, with hard scales thickened at their apices, under which are edible nuts. The fronds, not unlike those of palms, are used for Palm Sunday by Catholics.

Mactan, Magtan, small island, Cebu province, Philippines. It is of coral formation, low, with coconut trees and mangroves. Opon is the only town. Magellan the navigator was killed here in 1521.

Mactra, a genus of bivalve molluscs, including a number of common North Atlantic species. A species common along the eastern coast of the United States is the sea-clam (*M. solidissima*).

MacVeagh, Franklin (1837-1934), American merchant and public official, was born on a farm in Chester co., Pa. He was graduated at

Yale in 1862, and at the Columbia Law School in 1864. Abandoning legal practice on account of ill health, he engaged in a wholesale grocery business in Chicago. In 1905 he was vice-president of the American Civic Association. In 1909 he became Secretary of the Treasury in the Cabinet of President Taft.

MacVeagh, Wayne (1833-1917), American public official, brother of Franklin MacVeagh, was Republican State chairman 1863; and U. S. minister to Turkey 1870-1. He was Attorney-General in President Garfield's Cabinet 1881, but retired on the accession of President Arthur. He served as minister to Italy in 1893-7.

McVey, Frank Le Rond (1869), American educator, in 1895 was employed in New York as an editorial writer. He was instructor in history at Teachers College Columbia (1895-6), and professor of economics at the University of Minnesota (1896-1907). Since 1909 he has been president of the University of North Dakota.

Madagascar, a large island in the Indian Ocean, separated from the nearest point of the eastern coast of Africa by Mozambique Channel, about 250 m. wide. Its extreme length, from Cape Amber in the North to Cape Sainte Marie in the South, is 980 m., and its greatest breadth about 350 m. The main orographical features are two plateaus. These plateaus are separated by a saddle less than 2,000 ft. high, which has played an important part in the history of the island. Extinct volcanoes are scattered over the island, the chief being Ankaratra, the culminating point of Madagascar (8,790 ft.). Diégo Suarez, at the northern end, formed by the peninsula of Cape Amber, and Tamatave are good harbors. The climate is tropical, there is a cool, dry season from May or June to November, and a hot, wet season from November to April. The high plateaus enjoy a temperate climate. Terrific thunderstorms and hurricanes are of frequent occurrence.

The forests of Madagascar extend in a belt nearly around the island, and yield valuable timber—rosewood, mahogany, palisander (*jacaranda*), ebony, and other precious woods; fibers (as raffia and *Musatextilis*), copal and other gums, and India rubber. Edible fruits, as groundnut, coconut, breadfruit, banana, pineapple, guava, mango, tamarind, citron, orange, and lemon, are common; and cotton, hemp, vanilla, sugar cane, rice, maize, millet, manioc yams, coffee, and cocoa are grown. The traveller's tree is a striking form; ferns are particularly abun-

dant. The fauna is distinct from that of Africa, and is marked by the presence of lemurs and the curious aye-aye. The most widely distributed minerals are gold and iron, the latter being found in large quantities. There is also platinum. The people are occupied chiefly in agriculture, and there are great herds of live stock. Sugar cane is an important crop.

The most prominent people are the Antaimarina, or Merina, of Malay origin, and known to Europeans as the Hova. They live on the plateau of Imerina; their dominion, before French occupation, extending over two-thirds of the island. On the northwest coast there has been an infusion of Arab blood. The last native sovereign of Madagascar was Queen Ranavalona III, who succeeded to the throne in 1883 and was deposed by the French in 1897. The French claimed certain territory on the northwest coast, ceded to them by local chiefs. The Hova refused to recognize these cessions, and a conflict ensued. In 1885 peace was arranged, Diégo Suarez passing into the possession of France. The French then established a resident-general at the capital, claiming a protectorate, which was disputed by the Hova, but acknowledged by Great Britain. The French enforced it by an armed expedition, and annexed it in 1895. In 1942 Great Britain invaded and held parts of the Island.

Mad Cavalier, a name given to Prince Rupert of Bavaria.

Madder, a genus of plants (*Rubia*) formerly grown in large quantities in Western Europe, Turkey, and Japan, for the stable coloring matters, alizarin and purpurin, that are present in the root in the form of glucosides.

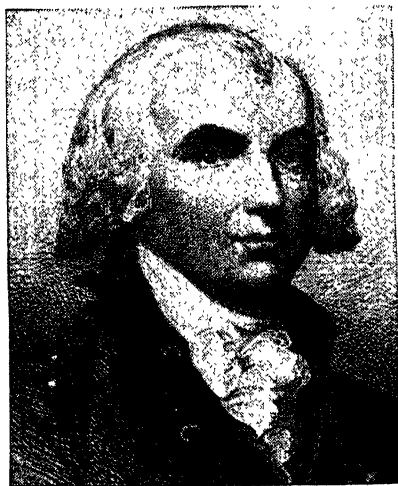
Madeira, a wine of Portugal which closely resembles sherry, having a fine, soft, mellow flavor. This wine takes its name from the island of Madeira, where much of it is produced. Among the important brands are Boal or Bual and Verdelho, rich, mellow, and choice; and San Antonio and Sercial, fine, dry, and pale.

Madeira (The Madeiras), a group of Portuguese islands in the Atlantic Ocean, including Madeira, Porto Santo, Desertas, Bujo, and Selvagens, the three first only being inhabited. Madeira itself is an oval island, measuring 35 by 15 m. The coasts are steep and rocky, the highest point, Pico Ruivo, reaching 6,060 ft. The mountain slopes are terraced for cultivation, and tropical, subtropical, and temperate fruits of all kinds are

grown at different levels, with the help of irrigation. The scenery is unusually picturesque. The equable and salubrious climate has made the island a favorite health resort. Funchal, on the south coast, is the capital and the principal port. Wines, linens, and wicker goods are made.

Madeira was colonized by the Portuguese in the 15th century. It was occupied by the British in 1801 and 1807-14.

Madero, Francisco Indalecio (1873-1913), Mexican statesman, son of a wealthy land owner, was born on the family estate of Rosario, in Coahuila. Through close contact with the prevailing labor conditions, he became the active foe of the peonage and contract labor system. He established political clubs throughout Mexico, developing from them a new national party through a convention held in the City of Mexico, and he travelled about the country, making political speeches in opposition to the re-election of Diaz. In June, 1910, he was arrested, and was held without bail on a minor charge until after the election, in which Diaz was victorious. He was set free in October, and made his way to Texas, where an uprising arose which eventually covered practically the whole of Mexico, as far south as Tehuantepec; with the capture of the city of Juarez,



James Madison.

Diaz was forced to resign (May 25, 1911). In the election of October, 1911, Madero was elected almost unanimously. He was deposed by revolutionists in 1913, and shot (Feb. 22).

Madison, borough, New Jersey, Morris co. It occupies an elevated site, surrounded by hills. It is a residential place, with few industries other than the culture of roses and chrysanthemums. It is the seat of Drew Theological Seminary; p. 7,944.

Madison, city, Wisconsin, capital of the State and county seat of Dane county. Its site is one of great natural beauty, being on a narrow strip of land, about 800 ft. high, between Lakes Mendota and Monona, with two others of the 'chain' near by. Important edifices include the buildings of the University of Wisconsin. The chief industries are flour and the manufacture of agricultural implements. The adjacent territory is rich agriculturally. The city was settled in 1837, and was named in honor of President Madison; p. 67,447.

the state, but which had lain dormant till Madison revived it and carried it to successful passage. He served as a member of the council of state of Virginia from 1778 to 1780, when he was elected a delegate to the Continental Congress, taking his seat March 20, 1780, the most important act of his early service being the drawing up of the instructions to John Jay, minister to Spain, which were adopted by Congress Oct. 17, 1780. They required Jay, in soliciting a treaty of alliance with Spain against England, to insist as a condition that the United States be accorded the right of free navigation of the Mississippi river from its source to the sea.

He was elected to Congress again in 1787, chiefly so that he might continue his fight against closing the river, and finally (1795) when circumstances were favorable, a treaty



Madras: Government House.

Madison River, a head stream of the Missouri River, rising 8,300 ft. above sea level in the Yellowstone National Park. It flows into Southwest Montana, thence in a northerly direction, along the base of the Madison range, to its confluence with the Jefferson or Beaver Head and Gallatin Rivers, at Gallatin City (Three Forks).

Madison, James (1751-1836), American statesman, fourth President of the United States. At the age of seventeen he entered the sophomore class of the College of New Jersey (now Princeton University), and was graduated in 1771 with honors. In 1775 he threw himself into the Revolutionary cause, his impaired health alone preventing him from going into the army. In 1876 he was elected a delegate to the Virginia Convention, and was one of the committee of thirty-two which presented to the Convention the Declaration of Rights which George Mason drew up. He introduced in the Virginia legislature the 'Bill for Establishing Religious Freedom in Virginia,' which Thomas Jefferson had written in 1779, as part of a revised code of laws for

was made with Spain by which American products were granted free progress down the river and the right of deposit at New Orleans, whence they might be trans-shipped to any point. In August, 1800, by a secret treaty, Louisiana passed from the ownership of Spain to France, but the fact did not become known until Madison became secretary of state in Jefferson's cabinet in March, 1801. He saw at once the danger in which the transfer placed the navigation of the Mississippi. In the autumn of 1802 the Spanish intendant at New Orleans withdrew the right of deposit of American goods, and the river was closed to American trade. War seemed imminent with Spain or France, when a combination of circumstances in European politics so affected the position of France that Napoleon determined to offer the whole territory of Louisiana to the United States. Livingston's course in agreeing to the purchase was fully approved by Madison.

The calling of the convention which framed the Constitution of the United States was brought about by a series of events in which

Madison played a principal part. At the Constitutional Convention which followed, the first plan of government offered was presented by the Virginia delegates and embodied Madison's ideas of what the government of the United States should be, and most of these ideas were incorporated in the constitution agreed upon. Madison, in conjunction with Hamilton and Jay, wrote the *Federalist* and secured the ratification by Virginia. If Virginia had rejected it, New York and other states would undoubtedly have followed her lead. The party in the state opposed to the adoption was ably led by Patrick Henry, and in the convention called to decide the question of ratification he made the greatest fight of his life, his chief opponent being Madison. Madison's success in securing ratification by Virginia was the greatest triumph of his career. He was elected to the first House of Representatives, having failed of election to the Senate because of Patrick Henry's opposition, and was recognized as its leader. Madison became secretary of state in Jefferson's Cabinet and held the office for eight years. When he became president in 1809 affairs were in such a train that war with England or France or both seemed almost inevitable, but he exhausted every effort to preserve peace before sending a message recommending war with Great Britain to Congress. The country was not prepared for the war which followed, and Madison had neither the personal force nor experience to qualify him for leading a nation in arms, and his administration in a military sense was a failure. His title to enduring fame was not in fact won when he was secretary of state or president, but in the earlier period of his public career when he demonstrated qualities of constructive statesmanship of the highest order. He died at Montpelier, June 28, 1836.

Madonna, the term usually applied to representations of the Virgin Mary in art. The earliest existing picture of her is said to be one in the Capella Greca in the catacombs of Priscilla, Rome, assigned to the first half of the 2d century. With the great artists of the 14th, 15th, and 16th centuries the Madonna was a favorite subject. Favorite incidents are the Annunciation, the Holy Family, the Adoration, the Assumption, and the Coronation. Celebrated Madonnas are by Mantegna, Botticelli, and Bellini, two or three reliefs by Donatello, and Michael Angelo's statue in the Medici chapel, Florence; Leonardo's *Virgin of the Rocks*; and three famous Raphaels.

Madras. Presidency of India, at the s. ex-

tremity of the peninsula. Its n. limits reach the Bombay Presidency on the one side, and the Bengal Presidency on the other. The rivers Godavari, Kistna (Krishna), and Cauvery rise in the W. Ghats, and discharge into the Bay of Bengal. The only important lake, Pulicat, 33 m. long, lies n. of the capital. Gold is mined in Mysore and in the Nilgiris. Forests cover 15,862 sq. m. Famines have been rather frequent. Although the presidency has no natural harbors, Madras on the east coast is one of the most important ports in the Indian empire, and the districts of Kanara, Malabar, and Travancore on the west are centers of considerable export and import. The chief articles of export are hides, coffee, raw cotton, rice, oils, spices, indigo, coir, sugar, tobacco, and tea. Diamonds are in the Karnus district. The bulk of the population are Hindus, but there are many Mohammedans, and the proportion of Christians (mostly Roman Catholics) is larger than in any other part of India. The Laccadive and Maldiv Islands, off the Malabar coast, are, for administrative purposes, included in the Madras Presidency; p. 4,200,000.

The Portuguese navigator Vasco di Gama visited Madras in 1498, and in 1502 established a factory in Cochin. About 1609 the Dutch made a settlement on the east coast; in 1611 English settlements were made at Nizampatam and Masulipatam, and in 1642 Cardinal Richelieu founded a French Company for the purposes of trade in Madras. From that time until near the close of the 18th century there were continual struggles among these powers for supremacy, but the English under Clive and Coote eventually drove out the other Europeans.

Madras, city and seaport, British India, capital of Madras Presidency. It stretches along the coast for some eight or nine m., the northern part, known as George Town (formerly Black Town), including the native and commercial quarters, and the southern part the residential section. In the extreme south is the old Portuguese town of St. Thomé. Madras has several fine parks; Fort St. George, the citadel, contains European barracks; St. Mary's Church is the oldest English church in India. Educational institutions are Madras University, Madras Christian College, the Law College, Pachayyappa's College, and the Presidency College; p. largely Hindus, 647,230.

The town of St. Thomé was founded by the Portuguese in 1504 and in 1639 the rajah of Chandragiri granted to the East India

Company a nearby site, which now forms the city of Madras. It was captured by the French in 1746 but restored to the British by the treaty of Aix-la-Chapelle (1749). During the World War the cruiser Emden shelled the town but was driven off by firing from Fort St. George.

Madrid, province, Spain, occupying the southern, and eastern slopes of the Guadarrama Mountains, and reaching down to the Tagus near Toledo. The climate is dry and hot in summer and bleak in winter. There are quarries of granite, lime, and gypsum; gardening and viticulture are carried on, and the northern forests yield good supplies of timber; p. 1,164,200.

Madrid, city, capital of Spain and of the province of Madrid, is more than 2,000 ft. above the sea. It is dry and windy, with extreme temperature variation. The older quarters of the city are in the western and southern parts, the newer quarters in the central and eastern portion. At the extreme east is El Retiro, a pleasure ground of 350 acres, with shaded walks, ponds, and statuary. The Puerto del Sol, an open square occupying the center of the city, is surrounded by modern hotels and business houses and from it radiate the more important streets. The Prado, or promenade, is shaded by several rows of trees, and ornamented with statues and monuments. Features of interest in the city are the Museo del Prado, with a fine collection of old paintings; including those of El Guco, Velasquez, and Goya; the *Armeria*, a world renowned collection of arms and armour; the Botanical Gardens; and the former Royal Palace. The leading educational institution is the University of Madrid. The chief industry is tobacco manufacturing; p. 1,195,000.

The history of Madrid begins with the Moors. It became a Christian city under Alfonso vi. (1083). Philip II. made it the capital in 1560. Madrid suffered much damage during the Civil War, 1936-39.

Madrigal, a term often used in a loose sense for any light song, but properly denoting a type of song of Italian origin which normally consists of two or three tercets, followed by one or more couplets. It is also used for the music written for such songs. Madrigals were either sung by three or more unaccompanied voices, or played upon viols. They were written by most of the 16th and 17th century composers.

Madura, city, India, capital of Madura district, Madras Presidency, is situated on

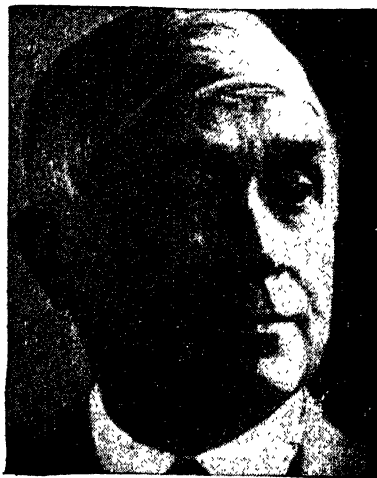
the Vaigai River; 270 m. s.w. of Madras. For centuries it was the religious and political capital of Southern India, and contains some of the finest examples extant of Hindu architecture. Of these, the most notable is the granite Temple of Minarchi, or the Fish Mother. The town has coffee and cotton mills, cigar factories, and manufactures of brass ware and dyed cotton cloth; p. 138,894.

Madura, island, Dutch East Indies, separated from Java on the w. by Surabaya Strait, and on the s. by Madura Strait; p. 1,743,818.

Mæander, river of Asia Minor, rises in Phrygia, flows between Lydia and Caria, and falls into the Ægean Sea. Its windings have made its name proverbial. The modern name is Menderes.

Mæcenæ, Gaius Cilnius (between 73 and 63 to 8 B.C.), Roman patron of letters. After Octavian became Emperor, with the title of Augustus, Mæcenæ was made administrator of all Italy. He maintained a fine establishment on the Esquiline Hill. Virgil, Propertius, and Horace were among his greatest friends.

Maes, or **Maas**, **Nicolas** (1632-93), Dutch genre painter. Chief among his paintings are *Old Woman Spinning*, *Girl Threading a Needle*, and many portraits, particularly of children. He is represented in the Metropolitan Museum, New York City.



Maurice Maeterlinck.

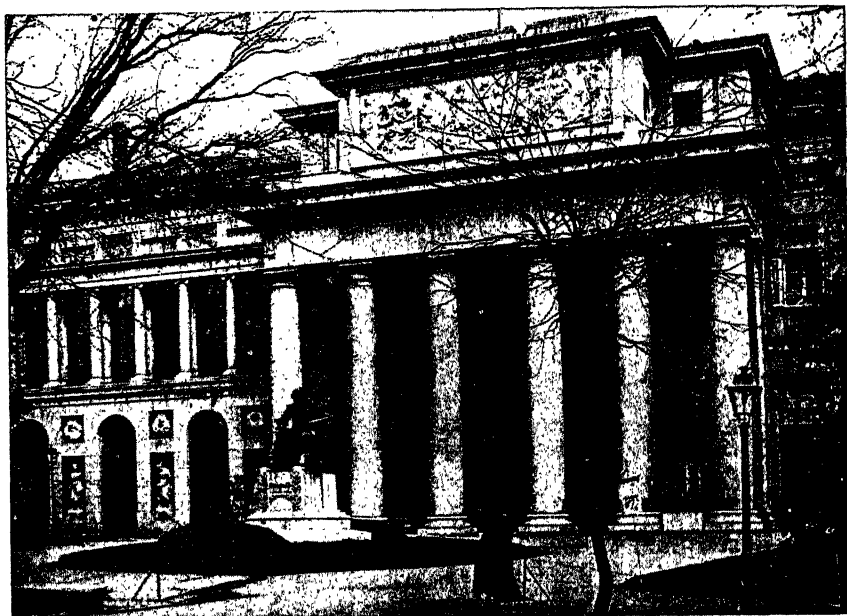
Maeterlinck, **Maurice** (1862-), Belgian dramatist and essayist, was born in Ghent. He studied law and became a barrister in 1887, but in 1896 settled in Paris and thenceforth devoted himself to literature. His

works include *Pelleas et Mélisande*, *L'Oiseau Bleu* (*The Bluebird*), *La Vie des Abeilles* (*The Life of the Bees*), *Monna Vanna*.

He received the Nobel prize for literature in 1911. Maeterlinck is a mystic and a dreamer, dealing in symbolism rather than reality. He came to the United States after Nazi occupation of France.

Mafeking, town, British South Africa, in Bechuanaland, ineffectually besieged by the Boers from Oct. 11, 1899, to May 18, 1900; p. 32,000.

London bookseller, brought out the *Gentlemen's Magazine*. The first two magazines to be issued in the United States appeared almost simultaneously in 1741 in Philadelphia, one published by Andrew Bradford as the *American or A Monthly Review*, the other by Benjamin Franklin as the *General Magazine or Historical Chronicle*. The *North American Review* was founded in 1815; the *United States Literary Gazette*, to which Longfellow and Emerson contributed, appeared in 1824. The *Atlantic Monthly*,



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Madrid, Spain: The Museo del Prado.

Mafia, a secret society in Sicily, whose members were bound to avenge and protect one another if punished for brigandage or crime by the authorities.

Magalanes, territory, Chile, comprising all the country lying south of lat. 47° s.; area 65,355 sq. m. The climate is quite rigorous. The chief town is Junta Arenas, on the Strait of Magellan; p. 28,960.

Magazine, a building or chamber for the safe storage of powder and ammunition.

Magazines, publications issued at more or less regular intervals, designed to furnish miscellaneous reading on a great variety of subjects. The modern magazine may be said to have had its beginning in 1731, when Cave, a

founded in 1858, was followed by such publications as *Harper's Magazine*, *Scribner's Monthly*, the *Century Magazine*, *St. Nicholas* for young folks, the *Cosmopolitan*, *Lippincott's Magazine*, *McClure's*, the *American Review of Reviews*, *World's Work*, *Forum*, *American Mercury*, *Nation*, and a host of other periodicals.

Magdalena, department in the northern part of Colombia, bordering on Caribbean Sea and separated from the department of Bolivar by the Magdalena River; area 19,080 sq. m. The chief crops are coffee, cocoa, sugar, and bananas; other fruits and vegetables are produced less abundantly. Santa Marta is the capital; p. 108,289.

Magdalena, river, Colombia, rises in the south, traverses nearly three fourths of the central part of the country in a northerly direction, and empties by two arms into the Caribbean Sea.

Magdeburg, town, Germany, capital of Saxony, is situated on both banks of the Elbe; 88 m. s.w. of Berlin. It is a strongly fortified town, the citadel occupying an island formed by the branching of the river. The town itself lies mostly on the left bank, and is irregular and rambling. Features of interest are the 13th-century Cathedral, containing the tombs of Otho the Great and his wife Editha; and a monument to Otho I., a huge equestrian statue erected about 1290. Magdeburg is an important commercial center; p. 335,000. From the 13th to the 15th centuries it enjoyed great commercial prosperity, and in the 16th century it espoused the cause of the Reformation. During the Thirty Years' War, the town was taken (1631) by the imperialists under Tilly, who cruelly ravaged it with fire and sword. In 1648 the archbishopric was converted into a duchy and given to Brandenburg.

Magee, William Connor (1821-91), British prelate, was born in Cork, Ireland. He was successively dean of Cork (1864), Bishop of Peterborough (1868), and Archbishop of York (1891).

Magellan, Ferdinand—in Portuguese Fernão de Magalhaes—(1470-1521), Portuguese navigator and explorer, was born probably at Villa de Sabrosa in Traz-os-Montes. He distinguished himself in the Indies and Malacca (1508-12) and served in Africa, but losing the king's favor on his return, he offered his services to Charles v. of Spain (1517). Aided by him, Magellan crossed the Atlantic to Brazil (1519-20), quelled a dangerous mutiny at San Julian, and discovered the strait later called by his name (Oct. 21, 1520). He then traversed and named the Pacific, and reaching the Philippines, fell in battle with the natives of Matan (April 27, 1521). One of his vessels continued the voyage, passed the Cape of Good Hope, May 19, 1522, and on Sept. 9, 1522, arrived at Seville, completing the first circumnavigation of the globe.

Magellan, Strait of, lies between Tierra del Fuego and the mainland of Chile. It was discovered in 1520 by Magellan, who called it *Todos los Santos*, and was explored by the *Beagle* in 1826-36. The only important harbor is Punta Arenas.

Magellanic Clouds, two round patches of

milky light near the south pole of the heavens, described in 1516 by Andrea Corsali the navigator, and named after Magellan.

Magenta, town, Italy, in the province of Milan, was the scene of the victory of the French and Sardinians over the Austrians, June 4, 1859.

Maggiore, or Locarno, Lago, lake, on the border between Italy and Switzerland, mostly in Italy. The northern end, which belongs to Switzerland, is known as Lake Locarno. The shores of the lake are lined with pleasure resorts.

Maggot, a name applied to certain degraded forms of insect larvae, but often used without any great precision. A typical maggot is a larva in which legs are absent, and the head is not distinctly defined from the body.

Magi, the priestly caste among the ancient Medians, and later also among the Persians. Magism was a worship of the elements, particularly of fire; and the Magi pretended to possess supernatural powers, whence our word magic. The name Magi seems to have been current, also, as a generic term for astrologers in the East, as is evidenced by the New Testament narrative of the homage of the Magi to the Infant Christ. Bede distinguishes them as Kaspar, Melchior, and Balthasar.

Magic, the alleged art of producing supernatural results by means of occult agencies. It is divided, according to the means employed, into demonistic, religious, and natural forms. Demonistic forms operate through spirits, religious forms through the priesthood and the cult, and naturalistic forms through the agency of the hidden powers of nature. When magic is employed with beneficent intent, as for example, in healing the sick, it is known as 'white magic'; when used with evil intent, so as cause death, misfortune or other harm, it is called 'black magic.' Magic is an element of the empirical religion of all times. It is generally considered to have appeared first among the Babylonians and the Egyptians. The Brahmins practised it, and in Buddhism a belief in a cult of magic finds abundant development. In modern China, Buddhist priests vie with Taoist priests in the practise of magic and divination. Under the Arsacids, in Persia, magic played so prominent a part in popular religion that the priesthood was known as Magian. Among the ancient Teutons and Celts religion was strongly infused with magic elements. The Druids were especially skilled in medical magic. During the Middle Ages the

struggle of the Church against magic, witchcraft, and kindred cults was difficult. The freedom of thought and doctrine following the Reformation, however, gradually destroyed belief in demons and devils. Among primitive peoples to-day, magic is still a potent factor. Consult Frazer's *The Golden Bough*.

Maginot Line, 'impregnable' fortifications built by France, 1925-1935, along her German frontier. In 1939 the Germans entered France through Belgium.

Magister Sacri Palatii, an official of the papal court who unites the functions of chief chaplain and theological adviser of the pope. About 1218 the office of Magister Sacri Palatii was formally established and other duties, such as the censorship of books, were added to that of homiletic instruction. It is always held by a Dominican.

Magma, in geology, a solution of rock-forming constituents highly charged with gases and aqueous vapor. Sometimes the magma never seems to reach the surface but when it does come to the top as a lava and cools rapidly it may solidify as a more or less homogeneous unit, forming a glass in which no constituent minerals can be detected; but if the cooling is slow the constituent minerals will separate out, forming a crystalline mass.

Magna Charta, the famous charter, called by Hallam the 'keystone of English liberty,' granted to the Barons by King John at Runnymede in the year 1215. It was called forth as a result of the unjust burdens and aggressions which for many years the barons had endured at the hands of Henry II., Richard I., and John. In July, 1214, John was defeated by the French at Bouvines and forced to make peace. On his return to England he was met by a confederation of the barons who demanded a charter of their rights, based on the charter of Henry I. Its principal provisions are: (1) A declaration that the Church of England is free. (2) Federal obligations are defined and limited. (3) Law courts are to be held at fixed places, assize courts are established and earls and barons are to be tried by their peers. (4) No extraordinary taxation without consent. (5) No banishment or imprisonment save by judgment of peers and the law of the land. (6) No denial, sale, or delay of justice. (7) One standard of weights and measures.

Magnesia ad Mæandrum, city, Asia Minor, near the Mæander River. It is said to have been founded by Magnes of Thessaly

and about the 7th century B.C. was destroyed by the Cimmerians. The ruins are of great extent and splendor, but many of them have been removed to European museums.

Magnesian Limestone, a variety of limestone containing a variable percentage of magnesium carbonate.

Magnesite, a mineral consisting of magnesium carbonate. It is used as a source of magnesium compounds and for the preparation of the magnesia bricks, obtained by calcination, and employed for furnaces where a basic lining is required.

Magnesium (Mg 24.32), a metallic element occurring, very widely distributed, in nature in combination, as magnesite (MgCO_3), dolomite (MgCaCO_3), Epsom salts ($\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$), carnallite ($\text{KClMgCl}_2 \cdot \text{H}_2\text{O}$), kieserite ($\text{MgSO}_4 \cdot \text{H}_2\text{O}$) and kainite ($\text{KClMgSO}_4 \cdot 3\text{H}_2\text{O}$). The following are the principal commercial varieties: *Light magnesium carbonate* or *magnesia alba levis*, prepared by mixing cold dilute solutions of sodium carbonate and magnesium sulphate and *heavy magnesium carbonate*, obtained when the solutions are concentrated and evaporated to dryness. Sulphate of magnesium or Epsom salts is a white crystalline solid that is soluble in water and present in many mineral springs. Magnesium chloride is a deliquescent and very soluble salt that gives off hydrochloric acid when its solution is evaporated. Magnesium chloride is also utilized to 'weight' cotton goods. Both the carbonates, the oxide, the sulphate, and their preparations, such as 'fluid magnesia,' which is a solution of the bicarbonate in water containing carbon dioxide under pressure, and 'citrate' of magnesia, act as saline purgatives; the oxides and carbonate are also mildly alkaline. Of the rest of the magnesium compounds the natural silicates, such as asbestos, soapstone ('French chalk'), and meerschaum are the most useful.

Magnetism. The natural magnet, lodestone or loadstone, called by mineralogists magnetite, or siderite, the black or magnetic oxide of iron, was known to the ancients, and certain of its properties were ascertained. Lumps of it tend to set themselves with a certain line in them approximately north and south; if it is dipped into filings of iron, these collect in clusters around two places which are the ends of the above-mentioned line, and these two patches exert attraction or repulsion on similar patches on other lodestones. The patches are called the 'poles' of the magnet, and the line the

magnetic axis. If a strip of hard steel is rubbed from the center to one end with one pole, and from the center to the other end with the other pole of the lodestone, it is found to take on all the properties of the lodestone, and the end rubbed with the north-seeking pole turns to the south, and *vice versa*. The north-seeking poles are found to repel each other, and south-seeking poles repel each other, while north poles attract south poles. Such a strip of steel, if mounted on a pivot, forms a magnetic needle or mariner's compass (see COMPASS). Such a bar magnet, if dipped into iron filings, will attract a bunch, thick at the ends, and thinning rapidly towards the middle. The strength of the pole is measured by the mechanical force it exerts on a similar pole, the unit pole being taken to be one that will exert a force of one dyne on a pole of the same strength placed at one centimetre distance.

The influence of a magnet extends out in all directions, its sphere of influence being called its magnetic field. Its form was investigated by Faraday by the sprinkling of iron filings over a sheet of card or glass laid over a magnet. When the sheet is tapped, the filings arrange themselves in strings, which radiate out approximately from each end of the magnet, bending round, some in small, others in large curves, to join those from the other end. These lines are called 'lines of force,' as they indicate the direction of the combined magnetic forces from the two poles. In a magnet the magnetism is not confined to the ends, but spreads over a considerable length. For purposes of calculation, however, it is convenient to consider the magnetism as concentrated at a point. A point is therefore selected near to each end, which will give the same magnetic effect on distant objects as the actual magnetism would do. These points are called the 'virtual poles,' and the distance between the two points is called 'the virtual length' of the magnet. The virtual length is from three-quarters to five-sixths of the real length according to the shape of the bar.

Oersted in 1820 found that there was a magnetic field round any conductor through which an electric current was passing. With a long straight conductor the lines of force form circles with the conductor as center, and the strength of the field is proportional to the current, and inversely as the distance from the center of the conductor. If the conductor is bent into a circle, the lines of force pass through the inside of the circle,

and return on the outside. Setting up a succession of circles on the same axis, with the current passing in the same direction in each, the lines of force will pass along the tube thus formed, returning outside. Such a succession of circles carrying a current is called a 'solenoid,' and is closely imitated by a coil of wire. Professor Ewing has shown that the mutual influence of the molecular magnets on each other will explain all the phenomena of magnetism in iron and other magnetic materials. The chief phenomena are as follows: when a very weak magnetic force is applied to the iron, the resulting magnetism is feeble, and is proportional to the force. An increase in the force produces a very large increase in the magnetism; but a further increase is less and less effective, until the iron ultimately reaches a condition of magnetic saturation. There are thus three distinct stages, which correspond to three conditions of the molecular magnets.

If a piece of iron so magnetized is removed from the coil, it is found to retain a portion of its magnetism. This is called 'residual magnetism.' In a long piece of hardened steel the magnetism is retained with very little loss for many years, and a moderate amount of jarring affects it but little; but with very soft pure iron the magnetism is completely lost if the iron is jarred. The straight bar magnet is often used for convenience, but it is not so permanent as the horseshoe form, for in this the two poles are brought near together, and the line of force pass directly across the narrow air gap, with less tendency to return along the metal. A high grade of tool steel will retain a considerable degree of magnetization. The addition of tungsten increases the strength of the retained magnetism, provided a keeper or its equivalent is built in the magnetic structure. Small magnets, such as compass needles, can be made by stroking the steel with each pole of a bar magnet in turn. But a more uniform magnetization can be obtained by placing the little magnets between the poles of a powerful electro-magnet of horseshoe shape.

If a line of force is traced out completely, it will be found to return into itself, making a closed path, or into the opposite pole of a magnet, through which it may be considered to pass to the initial pole. This path is called the 'magnetic circuit.' The total number of lines of force passing through a coil and around the magnetic circuit is called the 'magnetic flux.' Since the opposite poles of

two magnets attract each other, there will be a similar attraction between the cores of two electro-magnets, or between the two parts of the core of a single electro-magnet. This is used in electro-magnetic appliances for producing mechanical movement, which can be controlled by the electric current in the coil, and can thus be operated at a distance. It will be noticed that a high induction is more important than a large area, and therefore the poles of electro-magnets for lifting purposes are reduced at the ends, in order to concentrate the magnet effect. The appliance is used for lifting iron plates by employing an electro-magnet at the end of the chain of the crane instead of a hook or claws. Another application is seen in the magnetic clutch, by which the two halves of a line of shafting may be connected, or a pulley on a shaft may be fixed to it or run free. It has recently been discovered that certain alloys of the non-magnetic metals copper, manganese, and aluminum are almost as magnetic as cast iron, and show residual magnetism and change of permeability in the same manner. For all ordinary purposes, however, metals other than iron, nickel, cobalt, and magnetite may be considered non-magnetic. But careful examination shows that many substances are feebly magnetic. The salts of iron, nickel, cobalt, and oxygen are the most conspicuous, oxygen in the liquid state being appreciably magnetic. On the other hand, certain substances, notably bismuth metal, are less affected than empty space. Consult Ewing's *Magnetic Induction in Iron and Other Metals* (1904).

Magnetism, Terrestrial. The science of terrestrial magnetism dates its birth in the latter half of the 15th century, when it gradually became known that the compass needle does not, in general, point true north and south, but a certain number of degrees east or west; and, furthermore, that the actual amount varies with the locality. This divergence of the compass from true north is known to the mariner and to the surveyor as the 'variation of the needle,' but its more precise term is the *magnetic declination*. By the year 1600 considerable knowledge of the compass direction in various parts of the earth had become known. In the year 1576 Robert Norman, an English practical seaman and instrument maker, had discovered that the end of the needle which points to the north dips down, if the needle be mounted so as to swing in a vertical plane about a horizontal axis passing through its center

of gravity. This angle which a 'dipping needle' makes with the horizontal line, if its plane be set in the direction pointed out by a compass, is called the 'dip' or the *magnetic inclination*. From the facts known in 1600, William Gilbert, in his memorable work, *De Magnete*, drew the conclusion that the earth itself was a great magnet. Gilbert supposed, however, that the magnetic poles were coincident with the geographic poles; as a matter of fact, they are distant 1,200 m. and more from the latter.

The next great discovery was made in 1634 by another Englishman, Henry Gellibrand at London—*viz.*, that the compass even at the same place is not constant in direction, but suffers an appreciable change with the lapse of time. This is known as the *secular change*, and makes itself felt in all magnetic elements; not only in the magnetic declination, but in the magnetic dip, and in the strength of the magnetic force which the earth exerts to impart directive property to a magnetic needle. At London, in 1580, Borough and Norman had found that the north end of the compass bore $11\frac{1}{4}$ degrees east of true north; whereas Gellibrand, in 1634, found only $4^{\circ} 6'$ east. In the year of Cromwell's death, 1658, the compass pointed due north at London. Thereafter it began to swing westward by an ever-increasing amount, until about 1812, when it stood practically still for a few years at somewhat over 24 degrees west. In the United States the compass changes have not been as large, during the same interval of years, as in England—possibly not more than one-third to one-fifth. Still, they must be taken into account. The U. S. Coast and Geodetic Survey possesses the most extensive and authentic information for this country, and inquiries may be addressed to that organization for the latest data. For some as yet unknown cause the secular changes have recently been especially pronounced and complex. It is now generally believed that, as the result of the secular change, the magnetic poles shift their positions from time to time; but the data are not as yet sufficient for constructing the paths followed.

The *North Magnetic Pole* was first located by Captain James Clark Ross in June, 1831—in latitude $70^{\circ} 05' N.$ and longitude $96^{\circ} 46' W.$ The Norwegian explorer, Captain Roald Amundsen, during his recent successful accomplishment of the Northwest Passage, revisited the locality and made a number of

magnetic observations. *The South Magnetic Pole* was located from observations made by the English Antarctic Expedition in the *Discovery* in 1903; and again by the Shackleton expedition in 1909, which evidently visited the actual spot very closely. From the combined results of the two expeditions, the South Magnetic Pole is placed in about $72\frac{1}{2}^{\circ}$ s. and $155\frac{1}{2}^{\circ}$ E. For description of the mariner's compass, see COMPASS. See also MAGNETISM; NAVIGATION. Consult Watson's *Text-book of Physics* (1903); publications of the U. S. Coast and Geodetic Survey, and of the Carnegie Institution of Washington; U. S. *Magnetic Tables and Charts* (1905), and *Principal Facts of the Earth's Magnetism* (1909).

Magnetite, or magnetic iron ore, Fe_3O_4 , is an important ore of iron. It is found as a heavy (sp. gr. 5.2), brittle, black solid, with a metallic lustre (h. = 6). It has magnetic properties, though not many specimens exhibit definite poles.

Magnificat, the hymn of Mary (Luke 1:45-55). Its use in the services of the church dates back to at least the commencement of the 6th century. There are English versions of it from the 14th century.

Magnitogorsk, Soviet community, near the headwaters of the Ural River. Here is being carried out the most important enterprise under the second Five-Year Plan. The steel plant is expected to produce 2,600,000 tons of steel a year. Over 200,000 workers are located here in a mushroom community, without public buildings. It is estimated that Magnet Mountain, at the base of which is the new plant, will yield 300,000,000 tons of high grade iron ore. Technical advice was given the Russian organization by an American firm.

Magnitude, a conventional measure for apparent stellar brightness. Hipparchus and Ptolemy divided the stars into six classes or magnitudes. The system, later extended to telescopic stars, was rendered precise by the adoption of Pogson's light-ratio (1850). See Youngs, *General Astronomy* (1898).

Magnolia. A genus of very ornamental trees and shrubs, many of which are found in the United States, either wild or cultivated. Their flowers are generally large and erect, somewhat tulip-shaped and often fragrant; they are usually white, greenish, or pinkish.

Magnus, kings of Norway, chief among whom were:—MAGNUS, 'the Barefooted' (1073-1103), reigned from 1093; incorporat-

ed the Hebrides and Orkneys, together with the Isle of Man, in 1102. He made a descent upon Ireland, but was slain in battle, and buried at the cathedral of Down.—MAGNUS, 'the Lawgiver' (1238-80), crowned at Bergen in 1261. Besides the Norwegian codes, he compiled the code called Jarnsida for Iceland (1271-2). Under him the crown was declared to be hereditary and the realm indivisible. He restored the Hebrides to Scotland in return for an annual tribute. He was a friend to the clergy, and granted to the Hanseatic League privileges injurious to the commerce of his country.

Magnusson, Arni, or **Arne** (1663-1730), Icelandic historian and archæologist, born in W. Iceland; became professor of history and Danish antiquity in the University of Copenhagen. He made a notable collection of Icelandic manuscripts—which now bear his name and are the property of the university library.

Magoffin, Beriah (1815-85), American legislator, was born in Harrodsburg, Ky. He entered the Kentucky State Senate in 1850, and in 1859 was elected governor. Though a Confederate sympathizer, he attempted to maintain the neutrality of the State; refused to obey Lincoln's first call for troops, as well as a call from the Confederacy; and demanded that neither side should send troops within the State. The opposition of the State legislature led to his resignation in August, 1862.

Magoon, Charles E. (1861-1920), American lawyer and public official, born in Steele co., Minn. He became governor of the Canal Zone, then American minister to Panama. From 1906 to 1909 he acted as provisional governor of Cuba. He has written *Law of Civil Government under Military Occupation* (1902).



Magpie.

Magpie (*Pica rustica*), a bird of the crow family (Corvidæ), widely distributed in the Old World, and almost omnivorous in diet. The familiar 'pied' plumage renders the bird readily recognizable; in the male the black feathers are beautifully glossed with

green and violet, and set off by the white abdomen and shoulder patch. The nest is made of thorny sticks, mingled with roots and turf, and lined with clay. The eggs are from six to nine in number, and resemble those of crows. This bird is often tamed as an amusing but mischievous pet. A variety of this species is numerous throughout the Rocky Mountain region, but is noted for its 'garrulous gabble' and spluttering whistle. In the valleys of the California Coast dwells a second species, the yellow-billed magpie (*Pica Nuttalli*).

Magruder, John Bankhead (1810-71), American soldier, was born in Winchester, Va. He joined the Confederate Army as colonel, and after the skirmish at Big Bethel was promoted to brigadier-general (June, 1861), and major-general in October. During the Peninsula Campaign the skillful use of his small force delayed the entire Federal army. In January, 1863, he recaptured Galveston; took the *Harriet Lane*; dispersed the blockading squadron; and kept the port open to the end of the Civil War. He then served under Maximilian in Mexico until the latter's downfall.

Magyars (properly **Hunagars, Hungarians**), Finno-Ugrian or Finno-Turki people, who about 550 A.D. moved from the Ural region to the Volga, and after a long sojourn on the Russian steppe were driven west by the kindred Khazars. The bulk of the population have regular features, shapely figures, black hair and eyes, dark complexion, medium stature, quick, impulsive temperament, and intense patriotic feeling. See HUNGARY.

Mahabaleshwar, a tableland and the summit of the Western Ghats, about 70 m. s.e. of Bombay, having an average altitude of 4,500 ft. The village is a great sanctity in the eyes of Hindus, as the spot where the sacred Krishna has its source.

Mahábálipur (**Mahávellipur, Mamállapur**), village, India. It has famous ancient carvings, coins, sculptures, and monolithic temples supposed to date from the 5th or 6th century.

Mahábhárata, a sacred book of the Hindus, and the longest epic of the world.

Mahan, Alfred Thayer (1840-1914), American naval officer and historian, was born in West Point, N. Y. He was graduated at the Naval Academy in 1859. He became lecturer on history, and subsequently president of the Naval War College, Newport. He

represented the United States in the Peace Conference at The Hague in 1899. His reputation was made by his volume, *The Influence of Sea Power upon History, 1660-1783* (1890), and he holds high rank as an authority on naval history and practice.

Mahan, Dennis Hart (1802-71), American military engineer, was born in New York City. He was graduated at the U. S. Military Academy first in his class in 1824; and was professor of engineering there from 1830 until his death by drowning in the Hudson River.

Mahanadi, River, India, rises 25 m. s. of Raipur, in Central Provinces, and after a course of 550 m. falls into the Bay of Bengal by several mouths, about 120 m. s.w. of the Ganges delta. The drainage area is 43,800 sq.m. A canalization project was authorized by the government in 1912.

Maharajah. See **Rajah**.

Mahâyâna ('Great Vehicle'), the form of Buddhism which, formulated in the first or second century, gradually became the prevailing faith in Tibet, Mongolia, China, Korea, and Japan. It added to the earlier Buddhism a wealth of ceremonial; the conception of an Eternal Supreme Being, of whom the Buddha was a manifestation; the Bodhisattvas, who chose to forego Nirvâna in order to lend help and sympathy to all sufferers; and a doctrine of heaven and hell. Through the ministrations and influence of the Bodhisattvas, the aim of the Mahâyâna took the practical form of love and service, rather than the attainment of personal holiness, as in the older Buddhism.

Mahdi (Arabic 'the guided,' who will therefore guide others), the expected Messiah of the Mohammedans, who will inaugurate a reign of truth and justice on earth. From time to time Mohammedan fanatics have risen in Syria, Persia, Turkey, and Egypt, who, claiming to be the Mahdi, have attempted the prosecution of religious wars.

Mahim, section of Bombay, India, on n.w. coast of Bombay Island. There is a famous annual fair; p. 35,000.

Mahler, Gustav (1860-1911), Bohemian musical composer and conductor, was educated at Iglau, Prague, and the University of Vienna, and studied at the Vienna Conservatory. He acted as director of the opera in Budapest (1888-91); conductor in the municipal theatre in Hamburg (1891-7); director of the Imperial Opera House in Vienna (1897-1907); director of the Metropolitan

Opera House in New York (1908-9); and conductor of the Philharmonic orchestra (1909-11).

Mahmud I. (1696-1754), became sultan of Turkey in 1730, and was involved during the whole of his reign in wars with Austria and Russia, who had conspired to partition his kingdom. He inflicted several defeats on the Austrians, and recovered Belgrade, but did not make much headway against the Russians.

Mahmud II. (1785-1839), became Sultan in 1808. In 1826 he reorganized the army on European lines. Nevertheless he was forced in 1829 to recognize the independence of Greece; but successfully repressed (1833) the revolt of Mehemet Ali in Egypt. He also tried hard to reform the internal administration and finances of the empire.

Mahogany, the wood of a West Indian and Central and South American tree, *Swietenia mahagoni*, belonging to the order Cedrelaceæ. The tree requires about 200 years to reach maturity, and is then found 100 ft. high with a diameter of 6 to 12 ft. When felled, mahogany is of a light reddish-brown color, but it soon darkens on exposure to sunlight. The heartwood is heavy, hard, close and straight in grain, and takes a very high polish, with characteristic lustre, and sometimes with a wavy figure. Mahogany was used by Sir Walter Raleigh to repair one of his ships.

Mahomet, Mahommedanism. See **Mohammed, Mohammedanism.**

Maibashi (Maebashi, Mayebashi), chief town, Gumma prefecture (Kozuke province), main island, Japan, on the Tonegawa River; 70 m. n.w. of Tokyo, with which it is connected by rail. It is an important silk-trading center; p. 47,000.

Maid Marian, the legendary companion of Robin Hood and his band of outlaws in Sherwood Forest. Later, Maid Marian figured in the Morris dance connected with May day festivities.

Maid of Orleans. See **Joan of Arc.**

Maidstone, municipal and parliamentary borough, Kent, England, is situated on both banks of the Medway River which is spanned at this point by a fine modern bridge; s.e. of London. Maidstone was founded before the Roman Conquest, and in the Middle Ages became the property of the see of Canterbury; p. 17,357.

Maidu, a linguistic group of Indians, formerly occupying the northeastern part of California, along the valley of the Sacramento. They are often spoken of as the

'Diggers,' because of the great use they make of edible roots. They number about 1,000, occupying the Digger Agency, near Jackson, Cal.

Maimachin, Mongolian town and Chinese frontier post, opposite Kiakhtha, Siberia, in 50° 15' N. lat., in the Kentei Mountains, about 2,500 ft. above sea level. It is a caravan station, and trades in tea, silk, porcelain, paper, furs, and metal articles. The name is also given to a Chinese trade settlement near Urga.

Maimansingh, district, Dacca division, Bengal, India. Area, 6,332 sq.m. It is largely cultivated, jute being the chief export. The capital is Nasirabad; p. 4,837,730.

Maimonides, Moses ben Maimon (1135-1204), Jewish philosopher and physician, styled by the Jews **RAMBAM**, was born in Cordova, Spain, where he was forced outwardly to embrace Islam. Having emigrated to Cairo he became physician to the sultan of Egypt and rabbi of Cairo. He was a pupil and friend of Averrhoës, and wrote in Hebrew and Arabic, winning fame as a theologian and philosopher. He was learned also in mathematics and astronomy. Jews of the world celebrated the 800th anniversary of his birth in 1935. In Cordova, whence Maimonides fled as an exile, and in New York, great meetings were held and the American Academy for Jewish Research announced plans for a complete edition of the philosopher's works.

Main, river of Germany, is formed in Northeastern Bavaria by the junction, near Kulmbach, of the White Main and the Red Main. After a tortuous course of 307 miles, past Bamberg, Schweinfurt, Würzburg, Hanau, Offenbach, and Frankfurt, it joins the Rhine opposite Mainz.

Maine (called 'the Province or Countie of Mayne' in the charter given by Charles I. in 1639; popularly known as the 'Pine Tree State'), one of the North Atlantic States of the United States, in the group called the New England States. It is the most northeasterly State, and is bounded on the n. and e., respectively, by the Canadian provinces of Quebec and New Brunswick, on the s. by the Atlantic Ocean, and on the w. by New Hampshire and Quebec. With an extreme length of 305 m. from n. to s., and an extreme width of 270 m., Maine has a total area of 33,040 sq.m., of which 3,145 is water. The surface of the State is generally hilly, and in the n.w. is almost mountainous. The northern portion, embracing about one-

fourth of the State, is covered by vast forests and abounds in lakes. The southern part of the State slopes s. and s.e. from the central highland. This portion is drained by the St. Croix, Penobscot, Kennebec, Androscoggin, and Saco Rivers. Here are hundreds of lakes, among which are Moosehead Lake, with an area of 120 sq.m. and an elevation of 1,023 ft., and the Rangeley Lakes, with an area of 90 sq.m. and an elevation of 1,511 ft. The most prominent peak of the southern part is Mount Katahdin (5,200 ft.).



State Capitol, Augusta, Maine.

In the entire State there are 2,465 lakes, having an aggregate area of 2,300 sq.m. These lakes are so located at the head waters and along the courses of the rivers as to be of great value as storage reservoirs, furnishing a constant and abundant water power. By reason of this fact, and because of the numerous falls along the rivers of the southern slope, the industries of Maine are favored by a supply of water power variously estimated at from one to two million horse power. The sea coast of Maine is indented to a remarkable extent, giving the total coast line a length of nearly 2,500 m. The temperature varies from winter to summer, and from n. to s., through a wide range. The cool summers, the lakes, rivers, and forests, make Maine, and especially the Maine coast, very popular as a summer recreation resort. Maine was originally covered by vast forests, from which much of the finest timber has been removed. There are 40,630 acres of national forest, and 330,125 acres of State forests. The State maintains a fire-protective system which is particularly effective in the so-called 'Maine Forestry District' of about 10,000,000 acres in the northern part of the State.

Maine ranks next to Massachusetts among the New England States, and high among

all the States, in the value of its fisheries. The canning, smoking and salting of fish, particularly herring, cod, haddock, finnan haddie and mackerel, and the canning of clams are thriving industries. Maine far surpasses the other New England States in agriculture. Farms decreased from 48,227 in 1920 to 41,907 in 1935. The greatest acreage under cultivation lies along the southeastern coast. In the large county of Aroostook, which embraces the entire northern extremity of the State, farm lands are most valuable, the region being famous for its potato crop of 35,000,000 to 55,000,000 bushels annually. Of the total of 41,907 farmers, the great majority operated their own farms. The average size of a farm was 113 acres in 1935. The principal crops, with their acreage and yield in 1940 were as follows: White potatoes, 160,000 acres, 40,000,000 bushels; hay and forage, 1,000,000 acres, 900,000 tons; oats, 118,000 acres, 4,000,000 bushels; apples 900,000 bushels. There was a variety of lesser crops.

Owing to the great abundance of continuous water power afforded by the numerous rivers and the excellent harbors, manufacturing is very important. A leading industry, measured by value of products, is the manufacture of pulp from wood and other fibre. Ship building was formerly an important industry and Maine was foremost among the States in this respect. The population of Maine, according to the Federal Census of 1940, was 847,226. Foreign-born whites numbered 100,368; Negroes, 1,096; Indians, 1,012; Chinese, 115; Japanese, 3. The urban population represented 40.5 per cent. of the total. The inhabitants are mainly of the English Puritan stock of New England. There is a large element of French-speaking Canadian immigrants, and in the extreme north there is a considerable body of Acadian French who have occupied for nearly 150 years a fertile region on the river St. John.

School attendance is required of all able-bodied children of 5 to 14 years of age and of illiterates under 17 years. Public transportation is provided where necessary, in lieu of which school committees are allowed to pay the board of pupils. Secondary education is provided for in free public high schools and academies, many of which receive aid from the State. The State provides for the instruction and training of teachers in normal schools located at Castine, Gorham, Presque Isle, Machias, and Fort Kent. Higher education is provided by the University of

Maine, at Orono, which is endowed by the State; Bowdoin, at Brunswick; Bates, at Lewiston; and Colby, at Waterville. The present constitution of Maine was adopted in 1819, and has been amended frequently. The legislature is composed of a Senate of not more than 33 members and a House of Representatives of 151 members, all chosen biennially. The sessions begin on the first Wednesday in January of odd years. In 1908 Maine adopted the initiative and referendum for both State and city law-making. By a referendum of 1931 the voters adopted a plan for a complete reorganization of State administrative machinery, which consolidates all State boards and bureaus under five new departments—Finance, Health and Welfare, Education, Fisheries, and Audit—each headed by a commissioner appointed by the Governor for a three-year term. Under the National Reapportionment Act Maine has 3 Representatives in the National Congress. Augusta is the State capital.

The broken shore and numerous rivers of Maine furnished one of the earliest bases for European explorations in 1524, 1525, 1580, 1602, 1603, 1604, 1605. John Smith in 1614 explored the region, and left the more or less authentic 'Description of New England.' Settlements were made in 1604 to 1630. Various grants of land were made, covering the territory wholly or in part. The French king, Henry IV., granted it to De Monts in 1603. It was a part of the grant to the Plymouth Company by James I. of England in 1606. In 1622 Gorges and Mason received from the Council for New England a grant lying between the Kennebec and the Merri-mac, and extending 60 m. inland, which they divided so that Gorges received the portion e. of the Piscataqua. In 1639 Gorges established a provincial government at York. Ownership disputes arose. Massachusetts, called in as arbitrator, annexed towns and purchased claims, and came into complete possession of Maine by her charter of 1691. From earliest times till the present, the history of Maine has derived interest from her proximity to Canada by land and by sea. Overland incursions of French and Indians retarded her settlement for a century before 1763. Her coasts bore the brunt of naval descents from the north in the Revolutionary War and the War of 1812. Fishery and boundary disputes enlivened later relations with Canada. Armed skirmishing between Maine and New Brunswick in the late thirties led to the Ashburton Treaty of 1842,

which drew a definite territorial line between them. In recent years thousands of thrifty English and French Canadians have moved across into Maine to develop her farms or work in her mills. For various reasons Maine was restless under her union with Massachusetts. Her opportunity for separation came with Congressional disputes over slavery. As a new free State to offset a new slave State, her admission to the Union on March 15, 1820, was part of the Missouri Compromise.

Maine, University of, a State institution at Orono, Me., established in 1865 as the State College of Agriculture and the Mechanics Arts. The name was changed to the University of Maine in 1897.

Maine-et-Loire, department in the n.w. of France, formed from ancient Anjou. It is 2,812 sq. m. in area; is traversed from e. to w. by the broad valley of the navigable Loire, which is joined by the Maine. The soil is generally fertile, especially in the Loire Valley, and the country abounds in fine orchards and market gardens. Grain and live stock are important products, and flax and hemp are cultivated. There are extensive vineyards about Saumur; coal is mined in the Loire Valley; slate is quarried near Angers; and iron is mined at Sagré. The capital is Angers; p. 477,741.

Maine, U. S. Battleship. The anti-American feeling of the Spanish sympathizers in Havana was very strong for several years previous to the outbreak of the Spanish-American War. In the hope of establishing more friendly relations, the *Maine* was ordered to proceed there, and arrived on Jan. 25, 1898. She made fast to Buoy No. 4, near the Naval Station, and remained at this buoy until blown up on the evening of Feb. 15, 1898, at 9.40 P.M. Two officers and 258 men were killed or died of their injuries shortly afterward. A Court of Inquiry, ordered by the Navy Department, found that the destruction of the vessel was caused by the explosion of a large submarine mine underneath the bottom. The wreck lay in Havana Harbor until 1910, when Congress appropriated money for its removal. See CUBA and SPANISH-AMERICAN WAR.

Mainpuri, a district of the United Provinces, India, covering 1,675 sq. m. In general it is a level alluvial plain, broken only by the river channels; well wooded in parts, but with many large stretches of barren lands; p. 748, 027.

Maintenance, the common-law offence of maintaining a party in litigation in which the

offender is not personally interested. It generally consists in providing money for the prosecution of law suits. The form of maintenance practised by lawyers in taking causes on a contingent fee has generally been legalized in the United States.

Mainz (French *Mayence*), fortified city of the former grand-duchy of Hesse, Germany, on the Rhine, opposite the mouth of the River Main. It is one of the important fortresses of Germany, and one of the chief commercial centers on the Rhine. The older portion of the city has narrow streets and quaint Gothic buildings. The newer section is distinctly modern. The picturesque Cathedral dates back to 978.

The town's political importance dates from 747, when it was made an archbishopric. It was ceded to France in 1801 by the Peace of Lunéville, but was retaken in 1814, and incorporated with the grand-duchy of Hesse in 1816. Mainz is connected by a bridge with the strongly fortified town of Kastel (the *Castellum Mattiacorum* of the Romans), on the right bank of the Rhine. There are many remains of the Roman period in the neighborhood, notably the pillars of the great aqueduct. Gutenberg, the inventor of movable type for printing, was born here. During the World War it was frequently bombed by the Allies; its bridgehead was occupied by the French, Dec. 1918; p. 142,627.

Maiorescu, Titu (1840-1921), Roumanian statesman and author, exercised an epoch-making influence on recent Roumanian literature, both personally and by his essays—*Critice* (2 vols., 1892).

Maisonneuve, Paul de Chomedey, Sieur de (?-1676), French governor of Canada, was born in Champagne, France. After serving for a time in the French army, he formed the Associates of Montreal, and with four women and forty men reached Quebec in 1641. In 1642 he founded Montreal, and was its governor for 22 years.

Maisur. See **Mysore**.

Maitland, town, Northumberland co., New South Wales, Australia, on Hunter River. It was the western terminus of the first railway built in Australia (1855). Coal and kerosene shale are mined in the vicinity; p. 11,900.

Maize. See **Corn**.

Majolica, a term applied by Italian potters originally to enamelled and lusted ware, though now it is made to include also enamelled ware that is not lusted, and various imitations. The enamel is specifically tin dioxide. Tradition says that this type of pottery was

introduced into Italy by the Pisans from the island of Majorca in the 12th century. They had, however, made enamelled pottery long before that; but in the 15th century they appear to have learned, or discovered independently, the secret of the lustre of tin enamel. The principal seats of its manufacture were Forli, Faenza, Pesaro, Urbino, Gubbio, and Castel Durante. Much of this ware was highly decorated and painted in blue, ruby, yellow, 'silver,' 'gold,' and other colors, which were put on sometimes before, sometimes after the firing. Majolica continued to be made in Italy during the 17th and 18th centuries, and the classic types are cleverly produced at the present day.

Major, a military officer ranking between a captain and a lieutenant-colonel, and commanding a battalion of infantry, field artillery, or engineers, or a squadron of cavalry. The grade also exists in the various staff departments.

Major, Charles ('Edwin Caskoden') (1856-1913), American novelist and lawyer, was graduated from the University of Michigan in 1875, and was a member of the Indiana legislature in 1885-6. Among his works are: *When Knighthood Was in Flower* (1898); *Dorothy Vernon of Haddon Hall* (1902).

Majorca (Spanish *Mallorca*), the largest of the Balearic Islands, in the Mediterranean Sea. The coast line is indented with large bays, affording fine natural harbors. The soil is very rich, and the principal pursuit is agriculture. Large quantities of grain are produced, and tropical and sub-tropical fruits flourish. The race is much mixed, with Greek, Celtic, Carthaginian, and Provençal strains. The Moorish kingdom of Mallorca was incorporated in Aragon in 1343; p. 275,000.

Major-General, a military rank next below that of lieutenant-general, and above that of brigadier-general. In the U. S. Army the major-general commands a division.

Majority, the period when the legal disabilities peculiar to infancy or minority cease; or, to employ the popular phrase, the period when a minor becomes 'of age.' This is at the age of 21 years in most of the United States; although in a few, females attain their majority at the age of 18 years.

Makaroff, Stepan Ossipovitch (1849-1904), Russian admiral, was born in Nicolaieff. During the Russo-Turkish War of 1877 he torpedoed several Turkish warships. In 1894 he became commander of the Baltic fleet, in 1904 was given the command of the Russian fleet in the Far East, in the war with Japan.

Makart, Hans (1840-84), Austrian painter. In 1869 he settled at Vienna, and in 1879 was made professor at the art academy there. His *Diana's Hunting Party*, painted in 1880, is in the Metropolitan Museum, N. Y.

Makemie, Francis (1658-1708), clergyman, was born in County Donegal, Ireland. He settled in Virginia. In 1692, growing out of a controversy with George Keith, he was arrested at the instigation of the Virginia clergy, but successfully defended himself and obtained permission from the governor to preach throughout the colony. He was imprisoned in New York (1707) for two months, for preaching without a license. He was one of the most active founders of Presbyterianism in America.

Makran, the southernmost province of Baluchistan, bordering the Arabian Sea for about 200 m. between Persia and India. The principal port is Gwadar, which belongs to Arabia. The province is governed by the khan of Khelat under British supervision.

Malabar, maritime district of S.W. Madras, India, stretching for 145 m. along the coast of the Arabian Sea, extending inland to the Western Ghats, which rise to a height of 7,600 ft. The country is broken by heavily forested spurs and ravines falling into widening valleys, which shelve into rice plains near the coast. Forests yield teak, cedar, ebony, the fields rice, plantains, pepper, tea, coffee, spices, copra. Chief industries are mfr. of coarse yarns (coir) from coconut husks, fishing, wood cutting, oil pressing, and palm-leaf hats. Area, 5,585 sq. m.; p. about 500,000.

Malacca, a British colony on the Malay Peninsula, and the largest of the Straits Settlements, but commercially overshadowed by Singapore; consists of a strip, 40 m. long by from 8 to 25 m. broad, along the coast. Rainfall is heavy, climate hot and moist. Although gold and tin, formerly of leading importance, are still found in paying quantities, mining has practically ceased, and the industries are purely agricultural, chiefly the growing of rubber, tapioca, and rice, and the raising of swine. The fisheries are important. Area, 640 sq. m.; p. 232,159. Conquered by the Japanese in 1942.

Malacca, town and free port on the Strait of Malacca. In 1511 Malacca fell into the hands of the Portuguese, from whom it was taken by the Dutch in 1641. In 1824 it was exchanged with the British for Bencoolen in Sumatra; p. 21,213.

Malacca, Strait of, the channel separating the Malay Peninsula from Sumatra and

adjacent islands; is 550 m. long, varies in width from 185 m. in the n. to 35 m. in the s., where it encircles a group of populous islands belonging to and including Singapore.

Malachi ('my messenger'), the last of the books of the Old Testament, and in the Hebrew Canon the last of the 12 minor prophets. The writer lived after the return from the Captivity, and may have been contemporary with Ezra and Nehemiah (c. 460 B.C.).

Malachite, basic carbonate of copper, $\text{CuCO}_3\text{Cu(OH)}_2$. It is of common occurrence as a secondary product in almost every copper district, notably in Cornwall and South Australia. Arizona furnishes the most beautiful American specimens, and in this region it is also an important ore of copper. It is of emerald-green color, translucent to opaque, and somewhat soft (h. = 3.5; sp. gr. 3.9).

Malachy, St. (1094-1148), archbishop of Armagh, Ireland, became head of the abbey of Bangor, County Down, and bishop of Connor (1124). As archbishop (1132-6) he effected reforms; canonized by Clement IV.

Maladetta, group of granite peaks, wild and precipitous, in Central Pyrenees, Spain, separating the valleys of Benasque and Aran.

Malaga, a mountainous province of Andalusia, in Southern Spain, forming part of the ancient kingdom of Granada, and bordering on the Mediterranean Sea. The climate is almost tropical in summer, and very mild in winter, fertility and beauty being unequalled even in Spain. Mining, agriculture, and the manufacture of wines (chiefly Muscatel) are the principal occupations. Area, 2,812 sq. m.; p. 497,888.

Malaga, city, capital of the province of Malaga, a seaport with fine harbor on a bay of the Mediterranean. It has an export trade in citrus fruits, olives, olive oil, figs, raisins, almonds, grapes, and wine, cane sugar, and products of the distilling industry; also minerals, including iron and lead. The town is straggling, with narrow streets, but is picturesquely surrounded by gardens and vineyards, and almost enclosed by mountains. The Cathedral is a vast structure, mainly Gothic. The climate in winter is delightfully mild. Of Phœnician origin, Malaga was for centuries a Moorish city, and one of the principal ports of the kingdom of Granada; p. 150,000.

Malakoff, a famous fortification on the hill opposite Sevastopol, and one of its chief defences. The French carried it by storm, Sept. 8, 1855, after a siege of 11 months; its fall was followed by evacuation of Sevastopol.

Malampaya Sound, a land-locked arm of

the China Sea, n.e. of the Capoas peninsula, in the northern part of Palawan, Philippine Islands.

Mälär, lake of Sweden, 70 m. long, $\frac{1}{4}$ to 30 m. broad, with an area of 450 sq. m. Its surface is only from 1 to 2 feet above sea level. It flows into the Baltic through the city of Stockholm and the Södertelge Canal. The sea water, however, often streams into the lake, the cause being probably a difference of atmospheric pressure on the lake and the sea respectively. It is studded with over a thousand islands. On them, or its shores, stand the royal palaces of Gripsholm, Ulriksdal, Drottningholm, and Haga.

Malaria (sometimes called **Ague**, **Miasma**, and **Intermittent Fever**), a specific infectious disease, commonest in warm, marshy districts, in river valleys, and in the vicinity of small bodies of stagnant water. There are various types, the best known being the tertian (recurring every third day during the attack), the quartan (every fourth day), the quotidian, the tropical or malignant (so called because of its locale and severity), and autumnal-æstival, which tends to attack in spring and autumn. All, as far as is known, have like sources of infection—the mosquito of the species *Anopheles*, which carries the micro-organism of the malaria from the blood of one man to the blood of another. It has now been proved by experiment that if mosquitoes are fed upon malaria patients, they can communicate malaria to those upon whom they feed later, the malaria being always of the same type—tertian, quartan, etc.

For the prevention of malaria, the breeding-places of mosquitoes—damp, warm spots—must be drained, or the pools where the mosquito larvæ develop must be made uninhabitable. This has been successfully accomplished in some instances by covering the water surface with petroleum, or some other fluid which excludes the air. Stocking pools with fish which devour the larvæ is another useful preventive measure; and special care should be taken to avoid small accumulations of water in drain pipes, water barrels, buckets, etc.

The prevention of malaria by American sanitary engineers made possible the building of the Panama Canal—a conspicuous demonstration of the efficacy of these methods.

Malay Archipelago, or **Malaysia**. See **East Indies**.

Malay Peninsula reaches down from the mainland of Asia to within 2° of the equator; its extreme length is nearly 700 m., and its greatest breadth about 180 m. Its northern

boundary is the isthmus of Kra, while the island of Singapore lies off its southern point. The interior is occupied by a range of mountains (8,000 ft. to 10,000 ft.). The soil of the coast region is sandy. Immense deposits of alluvial tin occur in many places. The climate is damp, not very hot, and fairly uniform throughout the year; heavy rain is apt to fall at any season. The mountains and much of the flat country are still buried in primeval forests. The principal races are Malays and Malayo-Siamese half-breeds. The population exceeds 2,000,000. Japan captured the entire peninsula including Singapore, 1941-42.

Malays, a brown-skinned, straight-haired, round-headed people, of low or medium stature, living in all the islands between Madagascar and the Philippines, but centered chiefly in the Malay Peninsula and Sumatra. They are essentially maritime, and have never occupied the interior of any country except Sumatra, which they regard as their ancestral home. It is generally held that they form a branch of the Mongoloid stock; but so varied are their physical characters that it is safe to regard them as not belonging to any one race. Witty and even brilliant in conversation, dignified and refined in intercourse with strangers, they have never produced a literature or an art. Most of the definitely Malay tribes profess Mohammedanism, but practise magic and ancestor-worship. Their dialect is closely akin to those of the South Sea Islands, and has become to some extent the *lingua franca* of the Far East. Their most characteristic product is the *kris*, a thrusting weapon of many shapes.

Malay States, Federated, occupy the center of the Malay Peninsula, and have an area of 27,540 sq. m. They comprise Perak, Selangor, Negri Sembilan, and Pahang. The population, according to estimates of 1939 and 1940, is 1,169,313, almost equally composed of Malays and Chinese. The states are administered by a British Resident-General, but each state has a native ruler, who acts under a British resident. In December, 1909, the first Federal Council was inaugurated. The chief export is tin (about seven-tenths of the world's supply), and the chief import rice. The principal products are coffee, sugar, pepper, gambier, and tapioca. The forests yield timber, resins, canes, and gutta-percha. The chief city is Kuala Lumpur.

Malcolm, the name of four kings of Scotland, of whom the best known is MALCOLM III. (CANMORE) (1054-93), a child when in 1040 his father, King Duncan, was slain by Macbeth. In 1054 he ascended the throne of all

Scotland. For a number of years he was free to devote his energies to the consolidation of his kingdom, England being ruled by the peaceful Edward the Confessor. But after 1066 the history of his long reign is one of ceaseless warfare with the Norman. He twice invaded England, but on both occasions counter invasions forced him to surrender. MALCOLM IV. (1153-65), surnamed the 'Maiden King of Scotland,' surrendered to Henry II. (1157) Northumbria, Cumbria, and the strongholds of Newcastle, Bamborough, and Carlisle.

Maldive Islands, a group of thirteen coral islets in the Indian Ocean, 400 m. west of Ceylon. They yield millet, fruit, and edible nuts. The people are civilized, and engage chiefly in sailing and trade; p. 70,000.

Maldon, town, England, in Essex co., on the Blackwater. Lawrence Washington, great-grandfather of George Washington, was rector of Purleigh nearby from 1632 to 1642, and the tower of the church where he ministered has been restored by Americans as a memorial; p. 6,589.

Male Fern, a fern (*Dryopteris filix-mas*) which is common in the Old World, and which is found also in America, on the Pacific Slope and in the Rocky Mountains. It is a robust growing species, with sturdy green, bipinnate fronds, often three ft. or more in length.

Malet, Sir Edward Baldwin (1837-1908), British diplomat, was born at The Hague, where his father was minister. He served successively at Frankfort, Buenos Aires, Washington, Constantinople, Paris, Peking, Athens, Rome, Cairo, Brussels, and Berlin. In 1878 he was appointed minister plenipotentiary at Constantinople, and in the following year, agent and consul-general at Cairo, where he became one of the foremost figures in European politics. He was ambassador to Germany (1884-95), and in 1900 was a member of the International Court of Arbitration.

Malibran, Maria Felicita (1808-36), operatic singer, daughter of the Spanish tenor Manuel Garcia. She made her debut in 1825 in London, carrying the musical world by storm. She then visited the United States, and while singing in New York, where she met with great success, was married to a French banker, Malibran. From 1830 she sang continuously in Paris, Rome, London, and elsewhere.

Malic Acid, hydroxysuccinic acid, $C_4H_6O_5$, is a dibasic hydroxyacid occurring in unripe fruits.

Malice, a term of varying significance in

the law, ranging from active malevolence to criminal intent. It is in the latter sense that the term is used in criminal law, and in this sense it is an essential in every crime; and in the case of murder premeditation, called 'malice aforethought' must be present (See MURDER.) In civil wrongs, the presence or absence of malice in the sense of bad motive is, as a general rule, immaterial. The exceptions are as follows: (1) Actions for slander of title; (2) actions for malicious prosecution; (3) maliciously inducing others to break their contracts. The question of malice also becomes important in actions for defamation, in which the defense of privilege when it is set up may be rebutted by evidence of actual malice.

Malicious Injury to Property. The various criminal acts constituting malicious injury to property are now generally defined and regulated by statute. In every case the act must be done 'unlawfully and maliciously'; but malice towards the particular owner of the property need not be proved—it is sufficient to prove a general intent to injure.

Malicious Prosecution, the institution of a criminal action against a person from a malicious motive and without probable cause. If a man is prejudiced in his person or property by a malicious criminal prosecution, he has a right of action against the wrongdoer. To succeed, he must prove: (1) that he was innocent; (2) that there was want of reasonable and probable cause for the prosecution; (3) that the prosecution was initiated maliciously—from an indirect or improper motive, and not in the furtherance of justice. Maliciously making a man bankrupt, or having him arrested, petitioning to wind up a company, or obtaining a search warrant, are also grounds for action.

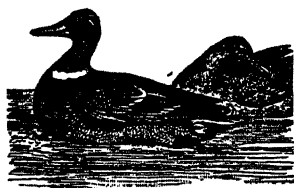
Malines, or **Mechlin**, city, Belgium, situated on the Dyle; 13 m. n.w. of Brussels. It is the ecclesiastical capital of Belgium, its most notable feature being the vast Gothic cathedral dating from the 13th and 14th centuries, and containing the famous Van Dyck *Crucifixion*. Other features of interest in the city are the Cloth Hall, begun in the 14th century; the churches of Notre Dame and St. Jans, each containing work by Rubens; the Palais de Justice, restored in the 19th century; the Botanical Gardens, and many quaint old houses. Malines was formerly famous for its lace, but of late years the chief industry has been furniture making; p. 60,400.

In the 16th century, when Margaret of Austria was appointed governor of the Nether-

lands, she chose the city as her residence and there formed a brilliant court frequented by scholars and artists. In 1559 it was created an archbishopric. During the Great War Malines was taken by the Germans in their invasion of Belgium, and was reoccupied by the Belgian army Aug. 24, 1914. It was three times bombarded: on August 27, when the roofs and walls of the Cathedral were pierced by German shells; on Sept. 2, when the Cathedral chime was shattered; and on Sept. 26, when the town was fired and the German occupation began.

Malingering, the feigning of disease which does not exist, in order to excite pity, avoid punishment, procure alms, or for a number of other purposes. A common example is the feigning of insanity by murderers as a means of escaping the full penalty for their crime. Various clever tests have been devised to detect malingering and it is becoming increasingly difficult to deceive the expert in medical jurisprudence.

Malipiero, G. Francesco (1882-), Italian composer, was born in Venice, and lived in Vienna, Berlin, and Paris. His compositions include the stage work *Elen e Fuldano*, *Cantossa*, *Pantea*, *Orfeo*, and the 'Mystery' *Francesco d'Assisi*; several orchestral works, among them the early *Sinfonia del Mare*, *Arione* (prize-winning poem for cello and orchestra); a string quartet (winner of the Coolidge prize, 1920); the choral *Canto Notturmo d'un Pastore*; many songs and pieces for piano. In addition he edited much early music.



Mallard.

Mallard, or Wild Duck, a species of duck which is widely distributed over Europe, Asia, and North America, and common as a breeding species in captivity. The term mallard is strictly applicable only to the drake, but is popularly used for both sexes. In captivity the bird breeds freely with almost any species of duck. It is more abundant in the interior of North America than on the coasts, congregating especially near lakes and rivers where wild rice grows and making its nest in marshes throughout the Mississippi valley and the re-

gion of the Great Lakes. It migrates southward in winter.

Malleability, the property almost exclusively possessed by a number of the metals, in virtue of which they can be flattened by hammering or pressure without crushing. This feature is most marked in the case of gold, which can be beaten out to such a degree of tenuity that one ounce will cover 189 sq. ft.

Malleco, province, Chile, lying between Bio Bio and Cautin on the n. and s., and between Bio Bio, Cautin and Arauco, e. and w., with an area of 3,303 sq. m. The climate is mild but damp. In the e. are high mountains, heavily wooded; the central part is a fertile plain famous for its wheat; in the w. are high hills. Angol is the capital; p. about 117,000.

Mallery, Garrick (1831-94), American soldier and ethnologist. In 1877 he was appointed ethnologist to Major Powell's Rocky Mountain Survey, and from 1879 to 1894 was chief of the U. S. Bureau of Ethnology. His chief works are on the Indians, their customs and language.

Mallow, a genus of herbaceous plants belonging to the order Malvaceæ. There are 30 species found in Europe, Asia, and North Africa, and some have been naturalized in North America. The Common Mallow (*M. rotundifolia*) is found along the roadsides in America. It has small pinkish flowers, followed by flat wrinkled fruits, often called 'cheeses.'

Malmédy, town, Belgium, in the government of Eupen-Malmédy, on the Warthe River, 25 m. s.e. of Liège. It is situated on what was formerly the German frontier and from 1815 to 1919 belonged to Germany. At the close of the Great War the territory known as Eupen-Malmédy, comprising 382 sq. m., was assigned to Belgium; p. 4,986.

Malmesbury, market town, England, in Wiltshire, on the River Avon. Its most notable feature is the ruined Abbey Church of which William of Malmesbury was once an abbot. Nearby is Garsdon, whose church contains several tombs of the Washington family; p. 2,405.

Malmesbury, William of (c. 1035-1143), Anglo-Norman chronicler, was born in Somersetshire and placed when a boy in the monastery of Malmesbury, of which he became librarian and precentor. His principal works are: *Gesta Regum Anglorum*, a history of the English kings from the Norman Conquest to 1128; *Historia Novella*, continuing the history to 1142. The *Gesta Regum Anglorum* has been translated into English.

Malmö, city, Sweden, capital of the government of Malmöhus, and of the province of

Skane, is situated on the Sound, opposite Copenhagen. Malmö is an important commercial city; it has the largest artificial harbor in Scandinavia and a flourishing export trade in dairy and agricultural products. There are manufactures of machinery, gloves, cotton, tobacco, iron, and woolen goods. In the middle ages Malmö was the chief commercial town on the Sound. Its modern prosperity dates from the opening of its harbor in 1775 and was further advanced by the completion of the railroad to Stockholm in 1856; p. 127,870.

Malmström, Johan August (1829-1901), Swedish genre and historical painter. He was made professor at the Stockholm Academy, of which he was later director (1887-93). His paintings deal chiefly with Norse history and folk lore. They include *King Heimar and Aslög*, *The Bravalla Battle*, and illustrations for *Fridthjof's Saga*.

Malnutrition. See **Nutrition**.

Malolos, pueblo, Luzon, Philippine Islands, capital of Bulacan province. It is situated at the head of the delta of the Pampanga Grande and is an important trade center. It was the tentative capital of the Filipinos under Aguinaldo; p. 14,000.

Malone, town, New York, county seat of Franklin co., and the northern gateway to the Adirondacks. The river furnishes good water power and there are manufactures of shirts, paper, pulp, lumber, doors, and sashes, and extensive railroad shops; p. 8,743.

Malone, John (1854-1906), American actor, was born in Westfield, Mass. He began acting in San Francisco in 1880, and afterwards played with Edwin Booth (1886-7), Mrs. Langtry (1888), Salvinia (1889-90), Modjeska (1897), and Richard Mansfield. He settled in New York City in 1900 and devoted himself to dramatic criticism.

Malonic Acid, $\text{CH}_2(\text{COOH})_2$, an acid occurring among the calcium salts formed in the manufacture of beet sugar. It forms both acid and normal salts.

Malory, Sir Thomas (fl. 1470), the author of *Le Morte d'Arthur*. According to Bale he was a Welshman, but Professor Kittredge identifies him with a certain Sir Thomas Malory of Newbold Revell in Warwickshire, who seems to have succeeded to the family estates about 1434. His great work was first printed by Caxton in 1485, who divided it into 21 books with chapters. Reprints were made in 1498, 1529, 1557, 1585 and 1634, but it was not issued again until 1816. A scholarly reprint was published in 1889. Malory's book, which is the first ambitious effort in English prose, has

been characterized as a pleasant jumble and summary of the legends concerning Arthur. His authorities are mainly French.

Malpighi, Marcello (1628-94), Italian anatomist, was born in Crevalcuore. He was one of the first to apply the microscope in anatomical study, and he made important discoveries as to the structure of the kidneys, lungs, skin and spleen. The Malpighian bodies, at the commencement of the uriniferous tubules, and the Malpighian corpuscles, tufts of blood vessels which form a part of these bodies, bear his name.

Malpighia, a genus of tropical American evergreen trees and shrubs belonging to the order Malpighiaceæ. They bear pink or white flowers, followed by fleshy drupes.

Malplaquet, village, France. It was the scene of the victory of Marlborough and Prince Eugene over the French under Villars and Boufflers on Sept. 11, 1709.

Malpractice, improper practice in professional work, either in law or medicine.

Malta, island in the Mediterranean Sea, under British dominion. The soil is extremely fertile, and agriculture is the leading industry. Malta is a strongly fortified island and one of the most important ports of call in the world; its harbor is England's first naval station in the Mediterranean. Valletta is the capital and chief port.

Malta was colonized by the Phœnicians, and thereafter held by the Greeks, and then by the Carthaginians, until the Romans took it in 216 B.C. St. Paul's Bay, on the n.w., was the scene of St. Paul's shipwreck in 60 A.D. Malta was granted (1530) by Charles v. to the Knights of St. John of Jerusalem. Taken by Napoleon in 1798, Malta surrendered to the British in September, 1800, and in 1814 was annexed to Britain; bombed by Ger. in World War I and by Ger. and It. in World War II, p. 275,000.

Malta, Ancient and Illustrious Order of Knights of, a fraternal beneficiary order incorporated in America in 1889.

Malta Fever, known also as **Mediterranean Fever**, **Undulant Fever**, and by a variety of other names, is a specific fever due to the *Micrococcus melitensis* Bruce, characterized by a long undulatory course, early arthritic symptoms, sweats, and progressive anæmia and debility. It occurs most commonly in the Mediterranean region.

Maltese Cat, a variety of domestic cat of a uniform bluish gray color.

Maltese Terrier, a small pet dog with a long, straight, silky, white coat, short body,

and short legs. The best specimens weigh from 4 to 9 pounds.

Malthus, Thomas Robert (1766-1834), English political economist, was born near Guildford, Surrey. Godwin's *Enquiry*, with its view of man's perfectibility (1797), led Malthus to make a study of population, on the basis of which he formulated the law that population is necessarily limited by the checks of vice and misery. The *Essay on Population* (1798) in which these propositions were set forth created a storm of criticism and abuse. His other works, *The Nature and Progress of Rents* (1815) and *Political Economy* (1820), are valuable contributions to the science of political economy.

Maltose, $C_{12}H_{22}O_{11} \cdot H_2O$, a sugar produced by the action of the diastase of malt on starch, about four-fifths of the latter being changed into maltose.

Malvaceæ, a natural order of herbaceous plants, shrubs, and trees, with alternate leaves and axillary flowers. Among the genera are Hibiscus, Malva (Mallow), Althæa, Abutilon, and Gossypium.

Malvern, Great, town, England, in Worcestershire. Its dry climate and excellent mineral springs have made it famous as a watering place. The Priory Church, the interior of which shows remains of the original 11th century structure, has a fine collection of 15th-century glass. Malvern is the burial place of Jenny Lind; p. 15,632.

Malvern Hill, Battle of, a battle of the Civil War fought at Malvern Hill, a short distance s.e. of Richmond, Va., on July 1, 1862, between the Federal Army of the Potomac under General McClellan and the Confederate Army of Northern Virginia under General Lee; the last of the Seven Days' Battles.

Mamaroneck, vil., Westchester co., N. Y., a popular summer resort. It has manufactures of raincoats, and rubber goods; p. 13,034.

Mamelukes, a term derived from an Arabic word meaning 'slaves.' They were originally a body of Turkish slaves whom Sultan Es-Sâlih Eyyûb introduced in the 13th century. After his death, and in the absence of capable successors, the Mamelukes elected a sultan out of their own number; and from that date (1251) till 1517 Egypt was ruled by a succession of these military slave-kings. Egypt—Cairo in particular—owes to them the most beautiful of its mosques. In 1517 the dominion of the Mamelukes was overthrown by the Ottoman Turks under Selim I., who, however, left them supreme in the provinces. The Mamelukes made their last noteworthy appearance when

Napoleon defeated them (1798) at the battle of the Pyramids.

Mammals, the highest class of vertebrates, characterized by their hair and the fact that the young are suckled. The two cavities of chest and abdomen are separated by a complete muscular partition, the diaphragm, which has much to do with the movements of respiration. The heart is four-chambered, and the single aortic arch curves to the left side, and not to the right as in birds; the lungs lie freely in the chest cavity, and are not bound down by membrane, as in birds; the surface of the brain is usually well convoluted, and the brain shows a number of anatomical peculiarities. Mammals are typically terrestrial animals, furnished with four limbs. But a few have become fitted like birds for aerial life—bats. Many have become aquatic, and here the whales mark the culminating point; similarly the mole shows the maximum adaptation to the fossorial life, and the monkey to the arboreal.

In classifying mammals, stress is laid in the first instance on the methods of reproduction. Mammals are in the general case distinguished from lower vertebrates by the fact that they give birth to living young, in place of laying eggs; but three living mammals lay eggs like birds and reptiles. It is, therefore, necessary to separate these mammals from all the rest, and form of them a separate sub-class, called Prototheria, or primitive mammals. Above this sub-class we come to the order of marsupials (kangaroo) in which the young are born alive, but in a very imperfect state of development, and are placed after birth in a pouch by the mother. These constitute the sub-class Metatheria, or later mammals. Finally, all other mammals give rise to fully developed young, and are included in the sub-class Eutheria, or well-developed mammals.

The mammalia may be classified as in the following table:

Sub-class: 1. PROTOTHERIA.

Order Monotremata—example, ornithorhynchus.

Sub-class: 2. METATHERIA.

Order: Marsupialia—kangaroo.

Sub-class: 3. EUTHERIA.

Orders—

(1) Edentata—sloth.

(2) Sirenia—manatee.

(3) Ungulata—horse.

(4) Cetacea—whale.

(5) Rodentia—rabbit.

(6) Carnivora—tiger.

(7) Insectivora—mole.

(8) Chiroptera—bat.

(9) Primates—monkey.

Consult H. E. Anthony, *Mammals of America* (1917); C. J. Cornish, *Mammals of Other Lands* (1917).

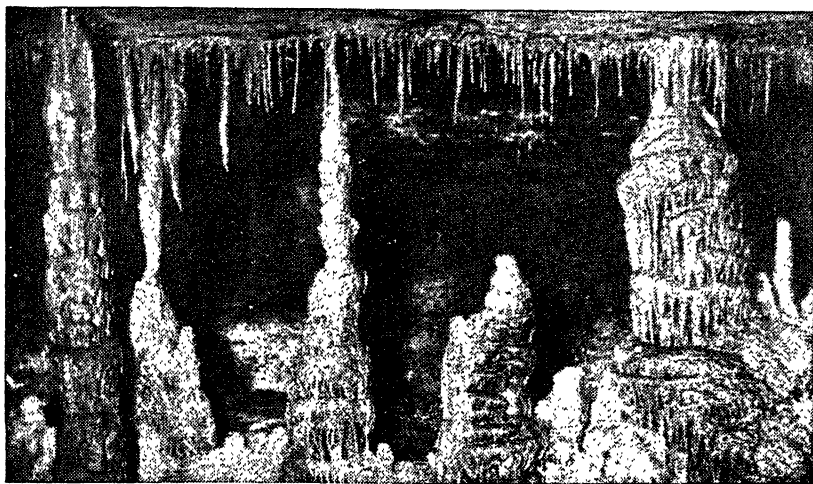
Mammoth (*Elephas antiquus*), an extinct fossil elephant, characteristic of the glacial and post-glacial periods. Great numbers of mammoth skeletons have been unearthed in Europe, but chiefly in N. Siberia and on the Arctic coasts.

Mammoth Cave. The largest known cavern in the world, situated in Edmonson co. Ky. Mammoth Cave is a complex series of more

Mammoth Tree. See *Sequoia*.

Mamouliau, Rouben (1898-), stage and screen director; organized and was director of the Eastman Theatre School; produced his first play on Broadway, *Porgy*, on October 10, 1927, which ran for two and one-half years. He has also directed *Marco Millions*; *A Farewell to Arms*; *City Streets* (1932); *Song of Songs* (1933); *Blood and Sand* (1941).

Man is zoologically a member of the order Primates, and is most nearly related to the anthropoid apes (family Simiidae). The distinguishing features which justify the erection for him of a separate family—Hominidae—are



Mammoth Cave, Kentucky.

than 200 so-called rooms, chambers, domes, abysses, pits, grottoes, avenues, and galleries extending for 9 m. underground. In certain of the lower caverns there are rivers, cataracts, and lakes, varying in volume with local rain supply. The most remarkable portions are the great pits and domes, which are caverns of unusual vertical extent. Crevice Pit with Klett's Dome, which is a part of it, is 150 ft. in total vertical measurement. The Bottomless Pit is 105, and Scylla is 135 ft. deep. Many parts of the cave are beautifully incrustured with gypsum and other deposits, while stalactites and stalagmites are abundant in some of the lower portions. The temperature of the cave is never above 59° nor below 52° F.

Mammoth Hot Springs, a remarkable group of springs occupying about a thousand acres in the northern part of the Yellowstone National Park.

chiefly the following. The brain-case and brain are proportionately much larger than in any anthropoid, while the facial portion of the skull is reduced in size, and is placed at a different angle to the brain-case, being below instead of in front of it. In the male sex in the European races the brain has an average weight of 1,360 grammes, while in the anthropoids the average weight is stated to be only 360 grammes. In man the teeth form a regular, uninterrupted, horseshoe-shaped series, the canines being small in both sexes, and not protruding. In connection with the upright position the skeleton shows a number of minor peculiarities; thus, the vertebral column presents a characteristic sigmoid flexure, only indicated in the apes; the lower limbs are proportionately much longer; the great toe is long and strong, and in the adult is incapable of being opposed to the other toes. Again, the

heel is better developed than in any anthropoid, and the foot has been so modified that it can be placed flat upon the ground. We may say concisely that, from the zoological standpoint, man differs from the anthropoids in his adaptation to the erect position and the terrestrial habitat, in his greater brain development, and in the very fully developed social instinct. To the zoologist there can be no reasonable doubt that he has arisen from an anthropoid stock or (mainly) arboreal habitat.

In his five fingers and five toes, in his separate radius and ulna and tibia and fibula, in his clavicles, in the structure of his teeth, man is primitive in structure—still shows relation to the insectivore stock from which he is lineally developed. The discovery by Dubois in Java of a portion of a skull and femur, believed to belong to a hitherto unknown form to which he gave the name of *Pithecanthropus erectus*, has done little to bridge the gap in man's ancestry. In the absence of evidence of a direct kind, we can only reason from analogy as to the probable course of evolution. Anyway, it is the social instinct which has played the predominant part.

As to the date of origin of man nothing definite can be said. The first clear indications of his existence anywhere on the earth are found in the deposits of the Glacial Period. The men of the Glacial Period fall into two groups, according as their implements are rough and unpolished (Palæolithic type) or smooth and polished (Neolithic type). Of the Palæolithic skulls found in Europe, the oldest is believed to be the Neanderthal or Spy type, which shows a number of pithecoïd characters, the forehead being low and retreating, the brow ridges prominent; and the stature apparently short; nevertheless, the Spy man was definitely human, and in no sense a transitional form. The Ipswich Man found near Ipswich, England, in 1912 is supposed to represent the earliest remains of man found in Europe. See *АНТРОПОЛОГИЯ*. Consult Darwin's *Descent of Man* (1888), Huxley's *Man's Place in Nature* (1858), G. A. Baitsell, *Evolution of Man* (1922).

Man, Isle of, in the Irish Sea, is 33 m. in length and 10 m. in breadth. A double or triple range of hills stretches south-westward through the island (Snaefell, 2,030 ft.). The island is a much frequented holiday resort. The principal towns are Douglas (the capital), Ramsey, Castletown, and Peel. The island is rich in stone circles, sepulchral mounds, runic and other crosses; possesses Rushen Castle, a well-preserved mediæval fortress, and Peel

Castle, formerly used as a state prison. The administration is vested in a lieutenant-governor representing the King, a council, and the elected House of Keys. The Manx language, now almost extinct, is a dialect of the Celtic. Area, 227 sq. m.; p. 49,338.

Managua. (1.) Lake in Nicaragua, Central America. (2.) City, cap. of Nicaragua, on lake of same name. In 1931, the town was totally destroyed and thousands of lives lost by the eruption of Mount Momotombo; p. 60,000.

Manar, or Manaar, Gulf of, inlet of Indian Ocean, between Ceylon and India, nearly 150 m. wide. The gulf is famous for its pearl fisheries.

Manatee (*Manatus*), one of the sea-cows or sirenians, formerly numerous in river-mouths and on nearby shores from Florida to Southern Brazil, and far up the large rivers of tropical S. America; few now remain n. of Yucatan. Like the dugongs, manatees are purely vegetarian in diet. A full-grown manatee is about 8 ft. long, and has a somewhat fishlike body, with a broad, flattened tail, a blunt muzzle, with a very mobile upper lip, minute eyes, and a finely wrinkled skin, covered with very delicate hairs. The fore limbs form paddles, as in the dugong, but except in one species, they bear three minute nails near their extremities. There is very free movement at the shoulder, elbow, and wrist. The special peculiarity of the manatee is found in the cleft upper lip, the parts of which have been compared in their manner of action to the mandibles of a caterpillar. Other peculiarities are the presence of only six vertebræ in the neck, the rudimentary nature of the incisor teeth, and the numerous (11) cheek teeth, which have square crowns with transverse ridges. Only about six of these teeth are in use at one time, and they are moved forward and shed when worn, much as in the elephant. Manatees are hunted for their oil and hides. They are easily tamed. Only one young one is born at a time.

Manby, George William (1765-1854), English inventor, born at Denver, Norfolk. He invented a life-saving apparatus for shipwrecks, for which he received grants from Parliament. He also gave his attention to lifeboats, and to life-saving apparatus for fires and for ice accidents.

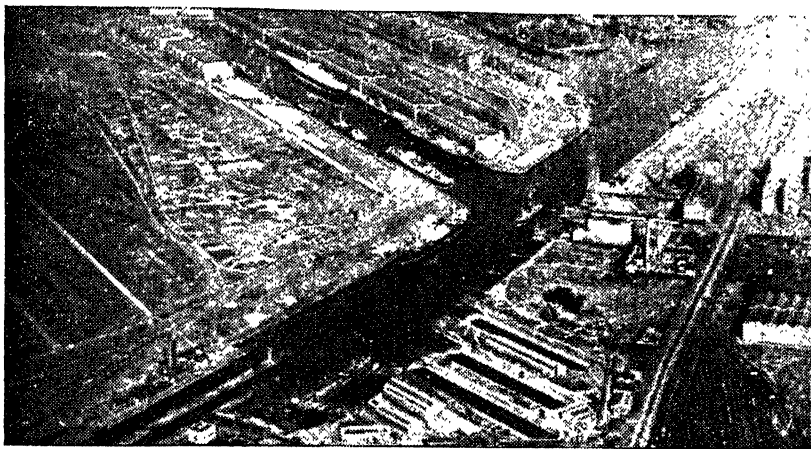
Mancha, La, dis. s. of New Castile, Spain. It produces a light red wine called Val de Penas, and is noted for its mules. The mythical Don Quixote and Sancho Panza nominally belonged to this district.

Manche, Maritime dep., N.W. France. The n.e. coast is low, and the w. shore inhospitable,

the only harbor being Granville. To the n. is the deep bay of Cherbourg. Hemp, fruit, beet-root, and cereals are cultivated. Area, 2,475 sq. m.; p. 433,473. Cap. St. L6.

Manchester, a city, county and County borough, with a lord mayor since 1893, seat of a bishopric since 1847, and of a university since 1880, in Lancashire England, 189 m. n.w. of London. Although 54 m. by water from the seat at Mersey Bar, it has access for sea-going vessels by means of the Manchester Ship Canal, opened in 1894. Essentially a modern city, Manchester is the leading center of the world in the cotton industry, spinning, weaving, bleaching and printing 'Manchester goods.'

Manchester, city, New Hampshire, one of the county seats of Hillsboro' co. and the largest city in the State; 16 m. s.e. of Concord. It is the financial and commercial center of the State, with a municipal airport, 226 acres of parks, and monuments to Gen. John Stark and the soldiers of the Civil War. In 1805 the first cotton mills were established and in 1807 a canal was opened between the city and Boston. It once had one of the largest textile mills in the world. It has a brush shop turning out about 50,000 different types of brushes; and a cigar factory producing about 75,000,000 cigars yearly; and holds high place in American shoe manufacturing. Wood boxes,



Deep Water Docks, Manchester, England.

There is also a large number of engineering works. Its shipping houses export cotton, silk and woolen goods; steam, gas and electrical machinery; chemicals, rubber, iron, steel and copper products.

Within 15 m. of the center of the city there is a population of 3 millions, and within 25 m., 4 millions, a greater number than that contained by any similar radii in the kingdom outside London. As the fourth port of the island, it is surpassed only by London, Liverpool and Hull. The City Art Gallery contains many very valuable treasures. The population at the 1931 census was 766,333. Since the redistribution of 1918 Manchester sends ten members to the Imperial Parliament in London.

Manchester College was founded in Manchester in 1786, and removed to Oxford in 1893. It exists for the purpose of promoting the study of philosophy, theology and religion, without insisting upon the adoption of particular doctrines.

bobbins, and timber are important products. The first settlement was made here in 1722. First named Amoskeag, it was incorporated in 1751 as Derryfield, and in 1810 the name was changed to Manchester; p. 77,685.

Manchester, town, Hartford co., Connecticut, on the Hockanum River. Here was established in 1836 the first silk mill in the United States, now one of the greatest in the world. Paper, cottons and woollens are important products. The first settlement was made here about 1672 and the town was a part of East Hartford until 1823; p. 23,799.

Manchester Ship Canal, a waterway by which large seagoing vessels can ascend to Manchester, England. This canal, among the greatest works of hydraulic engineering, was begun in 1887, and was opened to traffic on Jan. 1, 1894. It starts from Eastham, on the left bank of the Mersey estuary, about 4 or 5 m. above Birkenhead. The canal is 35½ m. long, 172 feet wide at surface and 120 feet at

bottom, and has a minimum depth of 28 ft. There is extensive dock accommodation at Manchester, Salford, Warrington, and elsewhere.

Manchukuo, formerly Manchuria, was called by the Chinese the four Northeastern Provinces, and comprised Liaoning (Fengtien), Kirin, Heilungkiang (Amur), and Jehol Provinces. It is surrounded roughly on the n. by Russian Siberia, on the e. by the Maritime Province of Siberia and Chosen (Korea), on the s. by the Yellow Sea, and the Gulf of Pechihli, and on the w. by the more or less elastic administrative line of Eastern Inner Mongolia.

The territory is often described as North and South Manchuria. The latter, in the most popular and widely accepted meaning of the

Iron and coal are the chief mineral resources. The Fushun open-strip coal mine near Mukden is one of the largest in the world, the annual production approximating 10,000,000 tons. The chief iron and steel works are at the Anshan and Penhsihu iron fields. Gold, copper, lead, manganese, oil shale, and magnesite also are mined. Bean-milling, flour-milling and lumbering are other important industries. Since 1931 the Japanese have made heavy investments in the development of industries and communications in Manchukuo.

In 1941 the population was 36,950,000, which included about 700,000 Koreans, about 230,000 Japanese, about 50,000 White Russians, about 500 British, about 500 Germans and about 300 Americans. The railways and



Manchukuo: Emperor Kang Teh on way to Coronation.

term, takes in the whole of Liaoning and the southern half of Kirin Provinces, while North Manchuria covers the rest of Manchukuo. The estimated size of the territory—for no scientific survey has ever been made—varies anywhere from 340,000 to 685,000 sq. m. The main geographic features are the great central plain, extending n. and s. between the Great Khingan Range in the n.w. and the Changpai Range in the s.e. The temperature range at Mukden is between 28° below zero to 95° F. The average during January, the coldest month, is zero, and during July, the hottest month, 72° F. The soil is the most important natural resource, supporting 80 per cent of the population directly. About 28 per cent of the total area is arable and about 46 per cent of the arable land is under cultivation. The soil is generally fertile. Of the total cultivated area, about 30 per cent was devoted to soya beans, 22 per cent to kaoliang, 17 per cent to millet, 9 per cent to maize, and 10 per cent to wheat.

the rivers are the chief means of transportation. There were about 6,500 m. of railway lines in 1941. There is also regular established air service between all of the principal cities and towns.

History.—Manchuria has always played an important role in Chinese history. Throughout most of its recorded history, Manchuria was inhabited by various Tungus tribes. During certain periods (under the Liao, Chin and Manchu dynasties) they conquered and ruled large parts or all of China. By the time of the Chinese Revolution, which overthrew the Manchus in 1911, the bulk of the Manchus had become racially assimilated with the Chinese. Chang Tso-lin was appointed Inspector-General of all Manchuria in 1918 by the Central Government of the Chinese Republic. Chang's allegiance to the republic was purely nominal, however, and in July, 1922, he renounced it completely. In 1924, he concluded an agreement with the Soviet Government. He participated in the civil wars

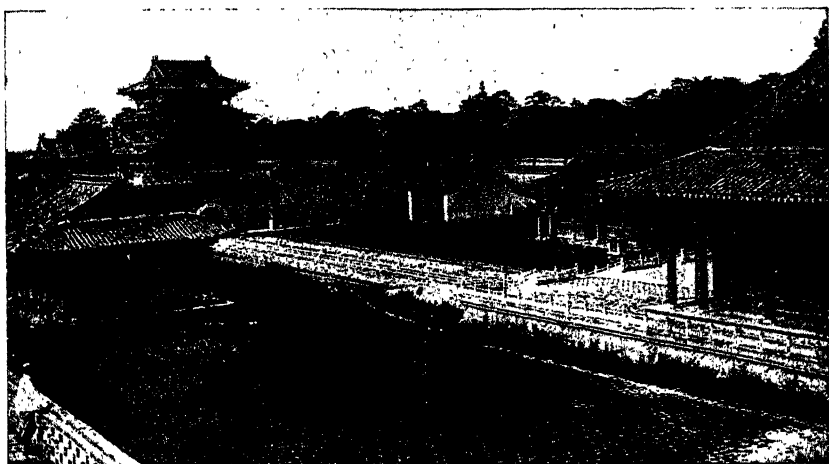
waged by the Chinese war lords and in 1924 captured Peking, extending his control over North China.

Chang Tso-lin had long been regarded as the protégé of the Japanese, who lent him their support in return for his protection of Japanese interests in Manchuria, and as the enemy of the Russians. In 1928 Chang was defeated by the Kuomintang (Nationalist) Army and driven from Peking. He was killed June 4, 1928, when an explosion, attributed to the Japanese, wrecked his train as it was about to enter Mukden.

Marshal Chang Tso-lin was succeeded as ruler of Manchuria by his son, Chang Hsueh-liang. Disregarding Japanese advice, he de-

(1895). Russia also helped China to pay off the war indemnity imposed by Japan, and in 1896 concluded a secret defensive treaty with China. In return she received from China the right to construct the Chinese Eastern Railway across Northern Manchuria. Construction of a Russian naval base was begun at Port Arthur. The Boxer Rebellion provided an excuse for the occupation of the whole of Manchuria. The Russian advance toward the South continued into Korea, alarming the Japanese, who suddenly began war on Feb. 8, 1904.

By the Treaty of Portsmouth the defeated Russians turned over to Japan the Liaoting Peninsula and all the special railway and eco-



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Pei-Ling Tombs at Mukden.

clared his allegiance to the Chinese Nationalist Government at Nanking in December, 1928. A virulent anti-foreign propaganda was inaugurated by the Kuomintang, with his acquiescence. The effects of the anti-foreign campaign were reflected in a systematic persecution of Koreans, the obstruction of Japanese and Soviet nationals in their economic activities, and the ill-treatment of the White Russians, although the latter had no special privileges.

Russia established almost complete control over Manchuria during the decade 1894-1904. At the conclusion of the Sino-Japanese War (1894-95) she intervened with France and Germany and forced Japan to return to China the Liaoting Peninsula in South Manchuria, ceded to Japan by the Treaty of Shimonoseki

nomie rights which they had won from the Chinese in Manchuria s. of Chang-chun. They retained and increased their influence in North Manchuria until the Bolshevik Revolution in 1917. Under cover of the Allied intervention in Siberia, the Chinese reestablished political control of North Manchuria in 1920. Subsequently the Chinese Eastern became a commercial undertaking under joint Sino-Russian management.

In May, 1929, Marshal Chang Hsueh-liang forcibly abolished the Soviet sphere of influence in North Manchuria. In November of the same year the Russians sent a military force into the railway area. The Manchurian troops were easily defeated and representatives of the Young Marshal signed an agreement restoring the *status quo* in North Manchuria

pending negotiation of a definitive treaty. These negotiations dragged on unsuccessfully in Moscow until the Japanese in September, 1931, ended Chang Hsueh-liang's control over Manchuria. Meanwhile Japan had been consolidating her position in South Manchuria.

By the 'Twenty-One Demands' of 1915, Japan secured from China additional special economic privileges in Manchuria. By the Nine-Power Treaty signed at Washington in February, 1922, Japan joined with the United States, Britain, France, and others in agreeing 'to respect the sovereignty, the independence, and the territorial and administrative integrity' of China, including Manchuria. The Japanese nevertheless considered that they held a special position in Manchuria. For both economic and strategic reasons they were determined that Manchuria should not be controlled either by the Soviet Union or by a united and nationally minded China. The Chinese, on the other hand, regarded Manchuria as an integral part of their territory.

After Marshal Chang Hsueh-liang succeeded his father as ruler of Manchuria, the Japanese found it increasingly difficult to maintain their special position. Finally, in September, 1931, the Japanese military decided to act. On the night of September 18, following an explosion on the South Manchuria Railway line near Mukden which they attributed to the Chinese, the Japanese put into operation a carefully worked out plan of military action. They had about 11,000 troops, railway guards, and gendarmes distributed along the South Manchuria Railway. They immediately attacked and dispersed the Chinese garrisons at all towns and cities along the line.

Successive 'anti-bandit drives' during 1932 and 1933 by the Japanese gradually crushed the irregular Chinese forces operating in Manchuria with the support of the Nanking Government and Marshal Chang Hsueh-liang. On Dec. 6, 1932, they drove General Su Ping-wen across the Soviet border at Manchuli, ending the last major threat from Chinese forces in Manchuria. The Japanese then carried through their plans for the annexation of Jehol, the Chinese Province adjoining Manchuria on the w. and comprising part of Inner Mongolia.

The State of Manchukuo.—The Japanese coup of September 18-19, 1931, resulted in the collapse of the Chinese civil administration of the three Manchurian provinces. New Chinese governments, under Japanese domination, were quickly organized. A board for the promotion of independence was established under Japanese auspices, and on February 18,

1932, a proclamation was issued declaring Manchuria independent of China. It was signed by the Chinese governors of the three Manchurian provinces and Jehol and by several Mongol princes. An All-Manchuria Convention, assembled at Mukden February 29, approved plans for the new state and designated as its provisional President the former Emperor Hsuan Tung of China, a Manchu known by his personal name of Henry Pu-yi. Inauguration ceremonies took place at Changchun (Hsinching), selected as the new capital, on March 9, 1932, and the establishment of the new government was announced to the powers on March 12, with the request that they recognize the new state.

The Organic Law of Manchukuo made the Regent head of the state, with authority to exercise executive power and to overrule the acts of the Legislative Council. The largest measure of actual power was entrusted to the Supervisory Council. The Japanese contended that the establishment of Manchukuo and its form of government was the fruit of a genuine and spontaneous independence movement on the part of the Chinese masses in Manchuria. The Lytton Commission found that 'while there were a number of factors which contributed to the creation of Manchukuo, the two which, in combination, were the most effective, and without which, in our judgment, the new State could not have been formed, were the presence of Japanese troops and the activities of Japanese officials, both civil and military.' On March 1, 1934, Manchukuo was converted into a separate hereditary monarchy, with Henry Pu-yi on the throne as Emperor. General Chang Ching-hui was appointed Premier on May 10, 1935.

On Sept. 15, 1932, representatives of Japan and Manchukuo signed a formal protocol of recognition of Manchukuo's independence. Japan agreed to cooperate in maintaining Manchukuo's 'national security' and received the right to station Japanese troops in Manchukuo for that purpose.

Manchukuo, the League, and the Powers.—Japan's conquest of Manchuria and Jehol was carried out in the face of strenuous and repeated protests from the League of Nations, the individual nations comprising the League Council, and the United States.

The report of the Lytton Commission, published October 2, 1932, denied Japan's claim that she had acted in self defense in Manchuria. On Feb. 24, 1933, the League Assembly adopted the report of its Committee of Nine—teen reaffirming Chinese sovereignty over

Manchuria, approving the Chinese boycott, and condemning Japan's whole course in Manchuria. The Japanese delegation immediately withdrew from the Assembly and on March 27, 1933, the Tokyo Government formally announced its withdrawal from the League.

A more tangible threat than the world's moral disapproval faced the Japanese military on the northern border of Manchuria. There the Soviet Government had concentrated more than 150,000 troops. The Russians, however, offered no resistance to the interruption of service on the Chinese Eastern Railway, and the ousting of Soviet representatives from its management. To avoid further trouble over the railway, the Soviet Government offered to sell its share to the state of Manchukuo and negotiations for the transfer were opened in Tokyo. The railway was formally transferred to Manchukuo in 1935.

At the close of World War II, in 1945, a Russo-Chinese treaty recognized the sovereignty of China in Manchukuo. The name *Manchuria* was restored.

Consult Kawakami, *Japan Speaks* ('32); H. W. Taft, *Japan and America*, (1932); Kawakami, *Manchukuo: Child of Conflict* (1933).

Manchuria. See **Manchukuo**.

Manchus, the rulers of China from 1644 to 1912. They were members of a Tartar clan living near Mukden. They carried on incessant warfare with China and finally captured the city of Tiaoyang which they made their Capital. In 1629 they attempted to march against Peking but were unsuccessful but in 1644 another attempt was made and the Manchu chief, Durgan, entered Peking and placed his nephew, a boy of eight, on the throne. The Manchu dynasty thus established lasted until the revolution of 1912 when it was overthrown.

The queue was a distinctive mark of the Manchus. On the whole they followed a policy of conciliation in China, attempting to adjust themselves to Chinese laws and customs, but they were generally 'anti-foreign' and tried to keep China apart from the rest of the world. The most illustrious of the Manchu rulers were Kang Hsi and Chien Lung.

Mandæans, or **Sabians**, an Oriental sect whose religion is compounded of Christian, heathen, and Jewish elements, somewhat resembling the worship of the ancient Gnostics. They occupy a portion of Mesopotamia, and their scriptures are written in an Aramaic dialect. The principal of these is the *Sidrâ Rabbâ*, or 'The Great-Book.'

Mandalay, the capital of Upper Burma,

India, on the left bank of the Irawadi; 386 m. n. of Rangoon. The original town is a square surrounded by a moat and encompassed by a wall. It has many pagodas one of which contains an image of Buddha that attracts thousands of pilgrims. Silk-weaving is the chief industry; p. 144,899.

Mandamus, a high prerogative writ, issued out of a court of superior jurisdiction, and directed to a court of limited jurisdiction, or to any person, public officer, corporation, or public body, commanding the party named therein to do some act connected with their official duties, and in some cases individual duty. It is known as an extraordinary remedy, and will only be granted when no other is adequate. Disobedience of a writ of mandamus is contempt of court.

Mandan, an almost extinct tribe of Indians formerly residing in the vicinity of Mandan, N. D. While they are of Siouan stock, they differ greatly from the other tribes. They were agriculturists, raising corn, beans, and squashes, lived in clay-covered log huts, and made pottery that resembled the ware of the Iroquois. In 1837 they were almost exterminated by smallpox.

Mandarin, general term applied by Europeans to Chinese government officials, civil or military. Their rank is indicated by the colors of the buttons on their caps. Admission to mandarin rank, and promotion therein, are regulated by state examination.

Mandarin Duck (*Aix galericulata*), a handsome bird allied to the wood duck of the United States, found in China. It is said to be monogamous and to remain paired for life.

Mandarin Orange (*Citrus nobilis*), a species of orange, smaller in size than most other species, and having an easily removed rind. It has a distinct subtle flavor and powerfully aromatic odor.

Mandate. In Roman and Scots law a contract by which one person obliges himself to do some act for another person or to manage his affairs gratuitously.

Mandates, a term in international relations which usually refers to the colonies of Germany and the Arabic parts of Turkey which were transferred by the peace treaties to the Allied and Associated Powers. The Allies could not, however, consider these territories as colonies proper. They were obliged to govern them in accordance with certain principles laid down in the peace treaties and by the League of Nations. The mandate principle was defined in Article 22 of the Coven-

ant. It declared, 'To those colonies and territories which as a consequence of the late war have ceased to be under the sovereignty of the States which formerly governed them and which are inhabited by peoples not yet able to stand by themselves under the strenuous conditions of the modern world, there should be applied the principle that the well-being and development of such peoples form a sacred trust of civilization and that securities for the performance of this trust should be embodied in this Covenant.' To give effect to this principle, the tutelage of these peoples was to be entrusted to 'advanced nations who, by reason of their resources, their experience or their geographical position can best undertake this responsibility.' This tutelage 'should be exercised by them as Mandatories on behalf of the League.' Altogether there are 16 mandates. The Class A mandates consist of those communities which have 'reached a stage of development where their existence as independent nations can be provisionally recognized subject to the rendering of administrative assistance by a Mandatory until such time as they are able to stand alone.' The Class A mandates are all located in the Near East and consist of Syria and the Lebanon governed under a mandate by France, and Palestine, Transjordan and Mesopotamia (Iraq) all governed under a mandate by Great Britain.

A second group is called the Class B Mandates; these are all located in Africa. They consist of French Togo and French Cameroons, British Togo and British Cameroons, Tanganyika held under British Mandate, and Ruanda-Urundi held under Belgian mandate. These territories are all in a more backward stage than the Class A mandates, and the mandatory is directly responsible for their administration.

A third group is called the Class C Mandates. With the exception of Southwest Africa, these mandates are all found in the Pacific. Southwest Africa is administered under mandate by the Union of South Africa, Samoa by New Zealand, Nauru Island by the British Empire, the former German islands s. of the equator by Australia, the former German islands n. of the equator by Japan. These territories are not only backward but sparsely populated, and they may be administered as 'integral portions' of the territory of the mandatory power. The population of the Class A mandates is about 6,500,000 people, while the population of the Class B and C mandates is about 11,000,000—a total of nearly 16,500,000. The total area of the mandates is 1,244,000

sq. m. In accepting a mandate each power was obliged to subscribe to certain obligations as defined by the Council of the League of Nations. In the past governments have signed treaties promising to treat humanely their native populations, but sometimes these treaties have become a dead-letter because there was no international machinery to interpret and to enforce the promises. The distinctive feature of the mandates system is the creation of machinery for this purpose. The administration of the mandates is placed under the general supervision of the Council of the League of Nations. To advise the Council, the Covenant of the League provided for the establishment of a Mandates Commission. The commission is only an advisory body, and all that the Council can do is to bring pressure of a moral nature upon a mandatory power. But so far the system has worked to bring about a higher level of administration in mandates than in adjoining colonies. Probably the chief defect of the system was that the mandates Commission had no right of independent investigation in these territories.

In World War II the mandates system was completely overturned.

Mandaue, pueblo, Cebu, Philippine Islands, on the e. coast, 4 m. n.e. of Cebu; p. 12,000.

Mandevilla, a genus of tropical climbing shrubs, belonging to the order Apocynaceæ. The species most often cultivated is *M. suaveolens* 'Chilean jasmine,' bearing sweet-scented white flowers in great profusion.

Mandeville, Sir John, the accredited name of the author of a notable book of travels, published in French during the latter half of the 14th century. The real author is supposed to have been one Jean de Burgoyne, who died in Liège (1372). The greater part of the book is borrowed from the *Epistle* of Prester John, the works of Friar Odoric, Vincent de Beauvais, and others.

Mandible, a term used to designate the lower jaw of vertebrates, and also the tooth-like appendages of the mouth in insects, crustaceans, and allied animals.

Mandingos, or **Mandénké**, African people, in Western Sudan, where they form the bulk of the population between the Upper Niger and the Atlantic. Some, such as the Veis of the seaboard, are pure negroes and pagans; but the great majority are a blend of negro, Berber, and Arab elements. Total population estimated at over 10,000,000.

Mandogarh, or **Mandu**, town, now deserted, in Dhar state, Central India, ancient capital of the Mohammedan kingdom of Malwa.

It was founded about 313 A.D. Among its ruins is the great mosque, one of the finest specimens of Afghan architecture in India.

Mandolin, a musical stringed instrument which may be termed a variety of lute. The form best known is the Neapolitan, which has eight strings tuned in four pairs of unisons to the same fifths as the violin, and set in vibration by means of a plectrum held in the right hand, while the fingers of the left regulate the notes.

Mandrake, or **Mandragora**, a genus of hardy herbaceous plants, natives of Southern Europe. They bear small pale-colored flowers, followed by globose, apple-like fruits. They have thick roots, and generally sinuate-margined leaves. From early times the mandrake has been superstitiously invested with all kinds of evil powers, having, in its forked roots, a fancied resemblance to the human form. The mandrake, so-called, of America, is the 'may-apple' (*Podophyllum peltatum*).

Mandrel, an iron rod used as a core on which something may be held while in a lathe or round which something may be bent cylindrically—e. g. the revolving shaft which carries the chuck of a lathe.

Mandrill (*Cynocephalus mormon*), one of the largest of the baboons, a native of the west coast of Africa. The head is large, the tail a short stump.

Mandsaur, or **Mandesur**, town, India, in the native state of Gwalior, 106 m. n.w. of Indore. The treaty which concluded the Maratha-Bindari War was signed here in 1818. It has a trade in opium; p. about 21,000.

Mandvi, seaport, Bombay, India, on the s. of the peninsula of Cutch, 36 m. s.w. of Bhuj; p. 45,000.

Manes, the name given to the spirits of the dead by the ancient Romans. See LARES.

Manet, Edouard (1832-83), French realistic painter. The novel, realistic treatment of his *Olympia* which reveals his endeavor to give purity of outline awoke bitter hostility but exerted a deep and lasting influence on the development of French art. One of the best of his paintings, *The Boy with the Sword*, is in the Metropolitan Museum of Art, New York. Other works include *Guitar Player*, *Dead Toreador*, *The Balcony*, *Dead Christ and Angels*, *Jeanne*, and many portraits.

Manettia, a genus of tropical evergreen, climbing plants belonging to the order Rubiaceæ. They are useful plants for greenhouse or conservatory, and for trellises, especially the common *Manettia* vine (*M. bicolor*) with scarlet tubular yellow-tipped flowers.

Manfred (c. 1231-66), king of Sicily, where he was born a natural son of the Emperor Frederick II. He reigned from 1258 until his death. He was excommunicated (1259) by Pope Alexander IV., but with his Saracens overran Tuscany, and won the battle of Monte Aperto (1260). He subsequently met Charles of Anjou in battle and was killed.

Manfredonia, seaport, Italy, in the province of Foggia. The town was founded in 1263 by Manfred, king of Sicily. It has an old castle and a cathedral and there are salt lakes in the vicinity. Figs and almonds are exported; p. (commune), 14,000.

Mangalore, seaport, municipality, and military station, Madras, India. The town is the headquarters of the Basel Lutheran mission in India, and the seat of a government college and of a Jesuit college; p. 53,877.

Manganese (Mn, 54.93), a metallic element obtained principally from manganite, MnO(OH), rhodochrosite, MnCO₃, and pyrolusite (black oxide of manganese, MnO₂). Other ores, found in much smaller quantities, are braunite (Mn₂O₃, usually also carrying some rhodonite, MnSiO₃) and wad, an impure mixture of several oxides. Additional sources of manganese are manganiferous iron ores, manganiferous residuum from roasting manganiferous zinc ores. The pure metal is obtained by reducing the oxide with aluminum, by vacuum distillation of impure metal, or by electrolysis of a manganese salt.

Manganese is a grayish-white metal, resembling iron, but harder, and very brittle; has a reddish tinge; and is more easily soluble in acids. Its specific gravity is 7.2, and it melts at 1260° C. Pure manganese is used only to a limited extent, most of the metal being produced alloyed with iron as ferromanganese or spiegeleisen in either the blast furnace or the electric furnace, and used in the manufacture of steel. (See STEEL).

The compounds of manganese are extremely varied, for it unites with oxygen in five different degrees. The high-grade ores are found in Montana, Arizona, Idaho, Arkansas, Virginia, New Mexico, Nevada, and in other States in small quantities. Consult Harder's *Manganese Deposits of the United States*; U. S. Geological Survey Bulletin 427 (1910); *International Control of Minerals*, published by the American Institute of Mining Engineers (1924); and the annual chapters in *The Mineral Industry*.

Manganite (Mn₂O₃.H₂O), a sesquioxide of manganese, occurring in dark gray or black crystals streaked with red, brown or black.

Its hardness differentiates it from psilomelane or pyrolusite. It is found in Ilmenau, Thuringia, the Harz Mountains, Saxony, India, New South Wales, and Arkansas.

Mangbetu, or **Monbuttu**, a former numerous and powerful negroid tribe of the Belgian Congo, Africa, living chiefly in the Gaba basin. Consult Van Overbergh's *Les Mangbetu*.

Mange. See **Dog**, *Diseases*.

Mangel-wurzel, a variety of the common beet (*B. vulgaris*), grown in Southern and Western Europe, Canada, and the United States for the feeding of live stock. There are several cultivated varieties, distinguished by the size and color of the root. As a food, it contains a higher percentage of dry matter than either turnips or swedes; and about two-thirds of the dry matter may be sugar, which increases in value by keeping.

Mangle, a machine for pressing clothes. See **LAUNDRIES**.

Mango, (*Mangifera indica*), an East Indian evergreen tree on the order Anacardiaceæ, whose fruit is highly esteemed. It grows almost 60 ft. high. In some varieties the fruit is a prime favorite, being eaten raw when ripe, and made into various preserves. It is widely cultivated in the West Indies, and to a lesser extent in the southern parts of Florida and California.

Mangosteen, the delicious fruit of a tropical evergreen tree, a native of the Straits Settlements, being cultivated in Java and in other tropical countries. Its round fruit is orange-like and divided into segments, holding a juicy, cooling pulp, delicate in flavor.

Mangrove (*Rhizophora Mangle*), a genus of tropical trees belonging to the order Rhizophoraceæ. It grows in swampy ground, and gradually reclaims land from the ocean's edge, both by the advance of its roots and by the habit of the seeds, which germinate while still attached to the parent tree—the young tree, ready formed with roots and branches, dropping into the water in advance of the parent stems. It is common among the coasts of Southern Florida.

Manhattan College, a Roman Catholic institution in New York City, conducted by the Brothers of the Christian Schools, and incorporated under its present title in 1863. It comprises the College of Arts and Sciences; the School of Business; the School of Architecture, and the School of Civil and Industrial Engineering. Non-Catholic students are received and registration is limited to 1,200. For recent statistics see Table under the heading **UNIVERSITY**.

Manhattan Island, an island at the head of New York Bay, 13 m. long and from $\frac{1}{2}$ m. to $2\frac{1}{4}$ m. wide. It is bounded on the n. by the Harlem Ship Canal (before its construction, by Spuyten Duyvil Creek); on the e. by the Harlem and East Rivers; on the s. by New York Upper Bay; and on the w. by the Hudson River. Its area is 22 sq.m. The rocky heights in the northern portion rise to an elevation of about 240 ft. The island is composed chiefly of Archæan rocks. Manhattan Island constitutes the borough of Manhattan in the City of New York. The southern part of the island is the trade and financial center of the city. It is said that Manhattan Island was purchased from the Indians for \$24 by Peter Minuit in 1626. See **NEW YORK**.

Manichæism, a dualistic system of religion which originated in Persia in the early 4th century. Its originator was one MANI, or Cubricus, who was born in Babylonia c. 216 A.D. Professing to have been the recipient of supernatural revelations, Mani traveled extensively in the East, even to India and China. He won the recognition of the Emperor Shapur, exercised considerable influence under Hormizd I., but was finally put to death by crucifixion and faying by Bahram I. He composed the *Book of Secrets*, the *Book of Precepts for Hearers* (or *Epistola Fundamenti*), and the *Book of Making Alive* (or *Thesaurus Vitæ*). Mani's teaching is founded on the dualism characteristic of Persian speculation, and is indeed only a materialization of it. Manichæism is a syncretism of Persian and Christian ideas, and Buddhist elements are not wanting. Consult fragments of Mani's writings in the *Bibliotheca Græca* of Fabricius (vii. 323 ff.), Mitchell's *St. Ephraim's Prose Refutations of Mani, Marcion, and Bardaisan* (1912).

Manifest, or **Ship's Manifest**, a document signed by the master, owner, or agent of a ship at a place of lading, and lodged with the proper customs officer. It must give a description of the vessel, crew, passengers (if any), ports of destination, and a full account of all the cargo, with marks, descriptions, consignors' names, etc. If for a foreign port, the coal or fuel for use on the voyage must also be stated.

Manihiki, or **Penrhyn**, group of twelve coral islands in the Pacific Ocean, n. of the Society Islands. They were annexed by Great Britain in 1888, and included in New Zealand in 1901. Area, over 500 sq.m.; p. 1,700.

Manihot, a genus of South American shrubs and herbaceous plants belonging to the order Euphorbiaceæ. The roots of *M. utilisissima* and *M. Aipi* are the sources of cassava meal and tapioca. See CASSAVA.

Manikaland, or **Manucaland**, district, South Africa, divided between Portuguese East Africa and Rhodesia. The country is noted for its gold fields.

Manila, the capital, largest city, and chief commercial center of the Philippine Islands, is situated on Manila Bay, on the western coast of the Island of Luzon. It stands on a level plain, only 3 or 4 feet above the sea, on both sides of the Pasig River, surrounded by a distant semicircle of mountains. The climate is mild and equable, ranging between 50° and 90° F. The annual rainfall averages between 84 and 114 inches. Although now embraced in one municipality, the thirteen suburban districts preserve the distinctive characteristics. The old city, with its bastioned walls, church towers, and balconied houses, preserves a mediæval air, and the large public buildings, in a heavy and sombre style, suggest the dominance of the religious orders under the former *régime*. At the time of the American occupation the chief buildings within the walls were the offices of the military government, artillery, cavalry, and infantry barracks, general offices of the civil administration, the Archbishop's Palace, the Cathedral, several churches and convents, the University, the College of San Juan de Lateran, the College of Medicine, and other colleges and seminaries. The walls have a circumference of 2½ m., and are pierced by six gates. The new aquarium stands in front of the Real Gate. The Plaza McKinley contains the official buildings. The U. S. Army headquarters are at Fort Santiago.

Avenue Santa Lucia extends along the beach, and terminates in a monument to Governor Anda. The Luneta, an elliptical drive farther south on the shore, is the most popular promenade. On it stand the new Manila Hotel and the Army and Navy Club. The Paseo de Magallanes extends along the river under the walls. An obelisk here commemorates the discoverer of the Philippines. The old moat has been filled in, and the site is now used for parks. Across the Pasig from the Walled City, and connected with it by the Bridge of Spain, is Binondo, the commercial center. At its lower end, near the Bridge of Spain, is the busiest spot in the city. Between Binondo and the bay is San

Nicholás, with the wholesale concerns and warehouses, the U. S. Custom House, commissary depot, and dock and port works. Tondo occupies the shore of the bay to the north. It is the most populous quarter. The streets are narrow, but traffic is facilitated by a great number of interlacing streams, which are utilized as canals, and give the district the appearance of an oriental Venice. Santa Cruz, n. of Binondo, is the second most populous quarter. It contains Bilibid, which is a famous government prison, St. Lazare, the leper hospital, and the Chinese cemetery. San Miguel, to the e., another small district, contains the residence of the former captain-general of the Philippines and other handsome villas. Another residential district, Sampaloc, adjoining on the n.w., has the widest and one of the most beautiful avenues in Manila.

Ermita and Malate, occupying the bay shore s. of the city, are residential districts with well built modern houses. The observatory and normal school are situated in the former. These two are the quarters chiefly favored by American families. The tract of reclaimed land known as the Port District contains the warehouses of the Bureau of Supply, and the site of the projected new Custom House. The native houses are generally constructed of bamboo and thatched with the leaves of the nipa palm. Manila is the terminus of the Manila Railway Company, which, with its projected extensions, makes direct rail connections with a large part of Southern Luzon. In addition to the public school system, in which special attention is given to handicrafts, the public educational institutions include the Manila Normal School and Schools of Commerce and Arts and Trades, Schools for the Deaf and the Blind, and the University of the Philippines. Among the institutions under private control are the Manila Observatory (assisted by the government), Manila University, the College of San Juan de Lateran, and the Medical College of San José.

The leading industries of Manila are the manufacture of cigars and cheroots, cordage, fabrics of Manila hemp, pineapple leaf fibre, cotton goods, masts, carpets, metal goods, cigar cases, liquors, distilled and malt, sawed lumber, ships and boats, brick and tile, boots and shoes, clothing, thread, and ice. The harbor, protected from monsoons by a concrete sea wall, contains an area of 350 acres, dredged to a depth of 30 ft.; with breakwaters extending into the bay from the

mouth of the river. The population of Manila is about 341,034. Manila is governed by a municipal board similar to that of the District of Columbia, the two native members of which are elected. A native village called Maynila, from a species of shrub which grew there, occupied the site of the city at the time of the arrival of the Spaniards. Cebú was the first headquarters of the western nation, however; and it was not until 1571 that Legaspi took the fortified Manila. In 1590 the foundations of the present fortifications were laid. In 1603 a fire destroyed one-third of the city, and an uprising of the

Aug. 13. In 1907, D. H. Burnham of Chicago visited Manila and mapped out a plan for the improvement of the city, which was adopted as the basis for subsequent development. On July 1, 1908, a new charter for Manila went into effect, which substituted one municipal council for the two boards of the previous government. It was captured by Japan, 1941, but retaken by Gen. MacArthur in 1945. Consult Wright's *Handbook of the Philippines* (1907); Arnold's *The Philippines* (1912).

Manila Bay, an arm of the China Sea, at the middle of the w. coast of Luzon. It is



Aerial View of Manila, P. I.

Chinese resulted in a general massacre disastrous to themselves. Taken and sacked in 1762 by a strong expedition of the English, the city was not restored until two years later.

The great earthquake of 1863 destroyed 46 public and 570 private buildings in Manila, and killed or injured 2,500 people. Dr. José Rizal, the Filipino patriot, was executed at Manila in 1896. The next year the city was declared under martial law, following a skirmish with the insurgents on the outskirts. On May 1, 1898, an American fleet under Admiral Dewey destroyed the Spanish fleet in the Battle of Manila Bay; and the city capitulated to the American forces on

30 m. in extent from the n. shore to Manila at the e., and from Manila s.w. to the entrance. Its entrance is 11 m. wide. Five provinces and the city of Manila touch its shores. The Rio Grande de la Pampanga flows into the bay through a large delta in the northeastern part. Many other rivers enter it, among which the Pasig at Manila, the Orani, and the Imus are the most noted. The roadstead at Manila, formerly exposed to the s.w. monsoon, is now protected by a concrete sea wall, and affords safe anchorage and excellent docking facilities for the largest vessels. The Pasig River connects Manila Bay with Laguna de Bay in the interior. The Battle of Manila, fought on May 1, 1898,

resulted in the destruction of the Spanish ships by the American fleet.

Manila Bay, Battle of, a naval battle fought in Manila Bay, Philippine Islands, on May 1, 1898, during the Spanish-American War, between an American fleet under Commodore George Dewey and a Spanish fleet under Admiral Montojo. The battle lasted from about 5.40 A.M. until about 12.30 P.M., and ended in the destruction of the Spanish fleet, the American fleet being practically uninjured. See SPANISH-AMERICAN WAR. Consult Chadwick's *Spanish-American War* (1911).

Manila Hemp, or **Abaca**, a name given to the fibre obtained from a Philippine plantain (*Musa textilis*) or banana plant, of which there are 14 varieties. The fibre is used for cordage, binding twine, sailcloth, fine grades of laces, and hat braids. See HEMP.

Manila University of Santo Tomas, an institution under Roman Catholic auspices founded in Manila, Philippine Islands, in 1611. The college, founded by the Dominican Order, received royal confirmation of its authority from Philip IV. in 1623, and in 1645 was erected by the Holy See into a university. It was completely reorganized in 1857.

Manilius, two Romans of note. (1) **Gaius Manilius**, tribune in 66 B. C., who proposed the Manilian law which gave Pompey full command in the Mithridatic war. (2) **Marcus** or **Gaius Manilius**, a Roman poet, who lived most probably in the Augustan age. He is known solely by his poem *Astronomica*.

Manin, Daniele (1804-57), Italian patriot, was born in Venice. In 1831 he became a leader of liberal opinion in Venice, and was made head of the Venetian republic. He yielded to the popular wish for annexation to Piedmont, which, however, was quickly defeated by the Austrians. A separate republic was again set up at Venice, with Manin as president. After ably withstanding an Austrian siege of five months, he was forced to surrender (1849).

Manioc. See **Cassava**.

Maniple, a strip of material similar to the stole, worn over the left arm by bishops, priests, deacons, and sub-deacons of the Roman Catholic and Anglican churches. See VESTMENTS.

Manipur, feudatory state under the political supervision of Assam, India, between Assam and Upper Burma. It consists mainly of an extensive valley, but the wooded heights in the n. rise to 8,000 ft. Its products

are tea, cotton, rice, tobacco, opium, and indigo. Native industries include the manufacture of silk and pottery. Manipur has been under British control since 1825, when a British force defeated the Burmese invaders of the state. The state was administered by the British during the minority of the raja; but in 1907 the latter took office under British protection. Area, 8,460 sq.m.; p. 385,000.

Manissa, town, Asia Minor, on the Gediz-chai, 21 m. n.e. of Smyrna by rail. It contains the palace of Kara Osman Oglu. Cotton goods and pack saddles are manufactured. At one time the place was noted for lodestone; p. 38,000.

Manito. See **Manitou**.

Manitoba, a province of the Dominion of Canada. It is bounded on the s. by Minnesota and North Dakota; on the w. by the province of Saskatchewan; on the n. by the Northwest Territories; and on the e. by Hudson Bay and the province of Ontario. Area. 246,512 sq.m. The land e. of the eastern shore of Lake Winnipeg is comparatively sterile and rocky. In the w. and s.w. stretches an undulating plain of greater altitude than the central prairie region and river valleys, known as the Riding and Duck Mountains—the former thickly covered with forests of pine. The northerly portion of the province is better wooded, the central and southern prairie region having comparatively few trees, except along the banks of the rivers. The three most important lakes are Winnipeg (260 sq.m.), Winnipegosis, and Manitoba.

Of the rivers of Manitoba, the mighty Saskatchewan, with its source in the Rockies, is by far the largest and grandest. The Winnipeg, which flows from Lake of the Woods into Lake Winnipeg, is a beautiful river about 200 m. long. At the junction of the Red and Assiniboine Rivers, 45 m. s. of Lake Winnipeg, is the capital of the province, the city of Winnipeg. All the rivers in the province eventually discharge their waters into Hudson Bay through Lake Winnipeg. The climate is cold in winter, the temperature falling occasionally to 50° below zero; but the severity of the cold is modified by plentiful sunshine and dry, bracing atmosphere, and the winters are healthful. The heat of summer is moderated by slight but steady winds, and the nights are cool. The rich mould or loam of the Red River and Assiniboine Valleys is noted for the production of grain, especially wheat. The eastern and northern parts of the province are for

the most part occupied by Laurentian strata of gneiss, quartzite, etc., with overlying belts of micaceous, chloritic, and hornblendic slates and slaty conglomerates of Huronian age. The eastern prairie or Lake Manitoba district forms the first prairie steppe. With an altitude of about 800 ft. it stretches w. to the base of the second steppe.

The best known portion of Manitoba, and the part most thickly settled, is prairie country, which in the summer is covered with grass and wild flowers of every kind and description. In the main, it is destitute of trees, except along the rivers and near the lakes, though occasional groups are encountered where these conditions are not present. The indigenous trees of the prairies include the elm, ash, oak, poplar, basswood, and maple. In the northern part of the province the country is much more thickly wooded. Here we find large forests of evergreen and coniferous trees. The prairies abound in prairie chickens; and in spring and autumn, ducks—canvas-back, black, and widgeon—are found in large numbers. Of fur-bearing animals there are the fox, beaver, badger, otter, mink, prairie wolf, and muskrat. Farther north, larger game is met, including bears, timber wolves, moose, and deer. The northern part of the province is traversed by the forest belt of Canada; but on account of the distance from the inhabited portions of Manitoba, and the absence of transportation facilities, little use has been made of the province's forest wealth. The lakes and rivers of Manitoba abound in fish of excellent quality and flavor. In the past the fisheries have received little attention to preserve them from depletion; but public opinion has at last been aroused to the danger and loss that may result from the extinction of a very valuable asset.

Manitoba is not a mining province; and mining will always be a relatively unimportant industry, owing to the scarcity of minerals. Nevertheless, minerals should not be neglected in a consideration of the resources of the province. The chief industry of Manitoba is agriculture, for which 10,000,000 acres are available within the old boundaries of the province. Wheat is the chief cereal, and oats, barley, hay, and flax are largely raised. There are a constantly increasing demand and price for horses and cattle; while large crops of coarse grass and fodder for their support can be grown easily and cheaply. The most important manufacturing industries in the province, from the point of

view of the value of products, are flour milling and slaughtering and meat packing. Winnipeg is by far the most important manufacturing center. Other towns with a considerable output are St. Boniface, Portage la Prairie, and Brandon.

In 1901 the population was 255,211; in 1911 it was 461,630—an increase during the decade of 206,419, of 80.9 per cent.; in 1916 it was 553,860; in 1921 it was 610,118; and in 1931 it was 700,139. The population of the province by the census of 1936 was 711,216. Of the province's entire population, about 311,000 or 44 per cent are urban. Of the total population, 362,389 are of British racial origin; 86,982 are of Ukrainian; 52,450 are of German; 47,683 are of French; 35,136 are of Polish; 25,521 are of Dutch; and 21,504 are of Scandinavian. Over 500,000 or some 70 per cent are Canadian born. The population of the more important cities and towns is: Winnipeg, 280,000; Brandon, 17,082; Portage la Prairie, 6,597. Large numbers of immigrants have entered the province in recent years. The most important elements in the recent immigration are British and American; but there are also many Swedes, Ruthenians, Germans, Finns, Roumanians, Italians, and Jews. The various denominational colleges—Church of England, Methodist, Presbyterian, and Roman Catholic—have been affiliated with the University of Manitoba at Winnipeg.

The legislative assembly is elected every four years, unless sooner dissolved, by manhood suffrage vote. The government is administered by a lieutenant-governor, appointed by the Governor-General in Council, and a ministry of six members responsible to the majority of the legislature. The provincial parliament consists of one house only. Manitoba is represented by six senators at Ottawa and seventeen members in the House of Commons. Verandrye, the French explorer, visited this region in 1738; but no permanent settlement was made until the Hudson's Bay Company, in 1812, granted 116,000 sq.m. of their territory to Lord Selkirk. Scotsmen, chiefly from Sutherlandshire, were sent out to colonize these lands, and a settlement near what is now Winnipeg was founded. The Hudson's Bay Company, having again acquired the lands, jealously guarded them and all the other territory under their control, discouraging settlement in order to foster their fur monopoly. The resulting conditions induced the Canadian government to purchase the company's rights

and property for \$1,500,000. Upon the admission of Manitoba as a province of the Dominion of Canada in 1870, discontent was shown by the French half-breeds, who considered their rights violated, and under the leadership of Louis Riel they rebelled and formed a provisional government. The rebellion was suppressed by the Canadian Government. By the Extension Act of 1912, the area of Manitoba was increased by 188,100 m., taken from the Northwest Territories. Consult G. Bryce's *Manitoba, Its Infancy, Growth, and Present Condition*; Gunn and Tuttle's *History of Manitoba*; John S. Ewart's *Manitoba School Question*; F. C. Wade's *Manitoba School Question, Reports of the Department of the Interior, Ottawa*; *Reports of the Departments of Agriculture and Immigration, Winnipeg*.

Manitoba, Lake, in the central part of Manitoba, Canada, at an elevation of about 800 ft.; 60 m. s.w. of Lake Winnipeg, into which it is drained by the Little Saskatchewan. Its length is about 120 m. and its breadth is about 25 m. Area, 1,900 sq.m.

Manitoba, University of, the provincial university, situated in Winnipeg, Canada, was established in 1877, and is the only institution in Manitoba that has the power to confer degrees in arts, science, law, medicine, and engineering. Affiliated with it are four theological and arts colleges in Winnipeg, the Manitoba Medical College, the Manitoba College of Pharmacy, and the Manitoba Agricultural College. For recent statistics see table of Universities and Colleges under the heading UNIVERSITY.

Manitou, or Manito, the great spirit of the Algonquin Indians, who figures in the legend of *Hiawatha*, as presented by Longfellow. But there are many manitous in the Algonquin pantheon. Consult Blair's *Indian Tribes of the Upper Mississippi Valley* (1912).

Manitoulin, group of islands in Lake Huron. Except for Drummond Island, which belongs to Michigan, they are Canadian. Many of the villages on the islands are summer resorts; p. 2,000.

Manitowoc, city, Wisconsin, county seat of Manitowoc co. It is situated at the mouth of the Manitowoc River, and has a good harbor. It ships large quantities of grain and coal. The city is the center of aluminum manufacture in America, and shipbuilding is carried on on a large scale; p. 24,404.

Manizales, town, Antioquia department, Colombia; 72 m. s. of Medellin. It is a

flourishing modern town, the trade center of Southern Antioquia. The principal exports are gold, coffee, and cocoa; p. 81,091.

Manley, John (1733-93), American naval officer, was born in Torquay, England. On Aug. 22, 1776, he was commissioned captain by Congress, and in October was assigned to command the *Hancock*, of 32 guns. With this he captured the British vessel *Fox*, but was in turn captured by the *Rainbow* and the *Victor*.

Manlius, Marcus, consul of Rome in 392 B.C. When the Gauls captured the city in 390, he took refuge in the Capitol, and one night, when the Gauls attempted to scale the rock, Manlius was awakened by the cackling of the sacred geese and threw down the first assailants. Six years afterwards he upheld the cause of the plebeians against the patricians, was accused of treason and executed.

Mann, Horace (1796-1859), American educator, was born in Franklin, Mass. He was a member of the Massachusetts legislature and senate from 1827 to 1837, and during 1837-48 was secretary of the Massachusetts Board of Education, when he devoted his entire time to the cause of educational reform, often encountering bitter opposition and criticism. He visited Europe in 1843 and on his return prepared reports of foreign school systems which had great influence in States other than his own. He was a member of Congress from Massachusetts 1848-1853, being re-elected as an anti-slavery candidate. From 1853 until his death he was president of Antioch College, Ohio. His works include *Lectures on Education* (1840), *Report of an Educational Tour in Germany, Great Britain, and Ireland* (1846), and *Letters and Speeches on Slavery* (1851).

Mann, Thomas (1875-), German novelist, was born in Leubeck. Through his first novel *Little Mr. Friedemann* he acquired a high reputation. In 1929 he received the Nobel Prize in literature. His published works include *Buddenbrooks* (1903), *The German Republic* (1923), *The Magic Mountain* (1924), *Joseph and His Brothers* (1934), *The Beloved Returns* (1940); *Joseph the Provider* (1943). He became a lecturer at Princeton University 1938.

Manna, a saccharine exudation from the stem of two deciduous trees, the flowering ash (*Fraxinus ornus*) and the round-leaved flowering ash (*F. rotundifolia*), natives of Sicily. The manna is obtained in summer by making incisions in the bark. The European

larch, and an American oak, and in America, the secretions of the sugarpine, and that of the common reed, afford mannas. The manna eaten by the Israelites in the wilderness is generally considered to have been the saccharine exudation of a species of tamarisk (*Tamarix mannifera*), the sap being set flowing by an insect of the Coccus genus.

Mannes, David, (1866-), violinist and director, born in New York City. From 1902 to 1911 he was concert master of the New York Symphony Society and in 1915 founded the Music School Settlement for Colored People. He is co-director with Mrs. Mannes of the David Mannes Music School and for many years has conducted free concerts at the Metropolitan Museum of Art.

Mannheim, city, Germany, in Baden. The palace, built in 1720-9, formerly the residence of the elector of the palatinate, faces the Rhine to the s.w. of the town and is one of the most imposing structures in Germany. Mannheim is one of the principal trading centers of South Germany. Founded at the beginning of the 17th century, Mannheim suffered severely during the Thirty Years' War, and was again destroyed in 1689 by the French; p. 284,000.



Cardinal Manning.

Manning, Henry Edward (1808-92), English Roman Catholic cardinal, was born in Totteridge, Hertfordshire. He became famous for his eloquence, and was a leader in the Tractarian movement. He was appoint-

ed archdeacon of Chichester (1840), and for some time was a leader of the High Church party; but eventually after many weeks of study and consideration, joined the Church of Rome, and was ordained priest (1851). He founded the Congregation of the Oblates of St. Charles, London (1857), became archbishop of Westminster (1865), and cardinal (1875). Cardinal Manning strove in every way to advance the education and social condition of the working people. His published works include *The Eternal Priesthood* (1883), *Sin and Its Consequences* (1876).

Manning, James (1738-91), American clergyman and educator, was born in Elizabethtown, N. J. He was selected by the Philadelphia association to organize in Rhode Island a Baptist college to be 'free from any sectarian tests.' The college, which received the name of the College of Rhode Island (now Brown University), was started with Manning as president in 1766, and was removed to Providence, where it afterward remained in 1770. He continued his collegiate duties at Providence until 1790, resigning in that year. Dr. Manning served in the Confederation Congress of 1786.

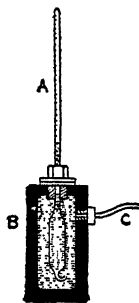
Manning, William Thomas (1866-), American Protestant Episcopal clergyman, was born in England. He went to the United States in 1876 and was educated at the University of the South, Sewanee, Tenn.; and ordained priest in 1891. He was assistant rector of Trinity Church, New York, in 1904; and succeeded Dr. Morgan Dix, as rector of Trinity in 1908. In 1921 he became bishop of the diocese of New York. Bishop Manning in 1925 inaugurated a campaign for funds to complete the Cathedral of St. John the Divine, New York City, which has met with a large measure of success.

Mannite, or **Mannitol**, $C_6H_5(OH)_6$, the simplest of the hexahydric alcohols, occurs in many plants, particularly *Fraxinus ornus*, from the dried exudation of which it is extracted by solution in alcohol and crystallization. It can be oxidized to levulose, and heated forms anhydrides.

Manœuvres, military exercises, on a more or less extensive scale, which complete the course of instruction of troops in peace by imitating as far as possible the circumstances of war. In the United States combined manœuvres of the coast artillery of the army and the navy are held from time to time. See NAVAL MANŒUVRES.

Man-of-War Bird, a term sometimes applied to the frigate bird, and also sometimes to the albatross and the skua.

Manometers, instruments for measuring liquid or gaseous pressures. In general they act on one of three principles: the pressure in question is balanced against either the hydrostatic pressure of a column of liquid, the pressure of a gas or the force required to deform a spring or raise a weight. In the first class the pressure exerted is proportional to the product of the height into the density of the liquid balanced. Manometers of this



Air Manometer for High Pressure.

A, Thick-walled glass tube; B, iron cylinder filled with mercury; C, flexible connection.

type, as a rule, give the difference of pressure above or below that of the atmosphere; the liquid being exposed on the one hand to the unknown pressure, and on the other to the atmosphere, and they require a reading of the barometer to get the true pressure. In the second class, which are capable of dealing with great pressures without becoming cumbrous, the pressure is set to compress a gas enclosed in a tube by an intervening column of liquid, usually mercury.

This type of instrument is particularly useful in experiments on the compressibility and critical point of gases. Manometers of the third class, in which, as a rule, a spring is deformed, are the ones most used for commercial purposes—e.g. as steam and vacuum gauges. A good type is that of the Bourdon pressure-gauge, in which a curved tube of elliptical section tends to straighten itself as its section becomes rounder when subject to internal pressure. This straightening is magnified and transmitted by suitable mechanism to a hand moving over a dial. Such instruments require to be calibrated by com-

parison, eventually, with a manometer of one of the other classes, and are not capable of such a high and permanent degree of accuracy, as the elasticity of the spring is not perfect or permanent. This is evident in the aneroid barometer (see *ANEROID*), which is a manometer of this class.

Manor, in English law, an estate in fee simple consisting of a tract of land granted by the sovereign to a subject in consideration of some service performed by him, the land being in its turn parceled out among subordinate tenants in fee, to be held of the lord of the manor. A manor becomes extinguished if it ceases to have two freehold tenants. Since the process of subinfeudation, by which a tenant in fee simple granted his land or any part thereof to others in feud to be held of himself as landlord, was abolished by the statute of *Quia Emptores* in 1289, it has been impossible to create any new manors. In the colonial period of American history a few manors existed in New York and some other colonies, but they have long since died out. See *FEUDALISM*; *TENURE*; *COPYHOLD*.

Manresa, city, Spain, in the province of Barcelona. Notable features are the Gothic church of Santa Maria de la Seo, begun in 1328, and the grotto of St. Ignatius over which is the church where Loyola spent many months in penitential meditation. Manresa is an ancient Roman city (*Minorisa*), and famous for its heroic defence in 1808-11; p. 27,300.

Manrique, Jorge (1440-78), Spanish poet, nephew of Gomez Manrique, wrote a set of elegiac couplets on the death of his father, which rank among the great poems of the world. They were translated into English by Longfellow.

Mans, Le, city, France, capital of the department of Sarthe, on the river Sarthe. It is an ancient town, the seat of a bishop. The beautiful cathedral of St. Julien has an eleventh century nave, a thirteenth century choir, and magnificent stained glass windows and contains the tomb of Berengaria, queen of Richard Cœur de Lion. The town is an important grain and flax market. Mans was the birthplace of Henry II. of England, and the scene of a battle in 1793 between the French republican troops and the Vendean forces. On Jan. 10-12, 1871, Chanzy was defeated here by the Germans under Prince Frederick Charles; p. 72,867.

Mansard Roof, ascribed to the French architect François Mansart (1598-1666), has a

break in the slant so that each side consists of two planes, the lower two having a greater slope than the upper.

Manse, legally the dwelling house of the minister of the Established Church in Scotland in a landward (*i.e.* rural) parish. Manse is now loosely used in referring to the home of the minister in churches of various denominations.

Mansfeld, Ernst, Count (1580-1626), German soldier, illegitimate son of Count Peter Ernst Mansfeld, was famous as a military leader. In 1622, he inflicted a crushing defeat on Tilly at Wiesloch. In 1624 he raised an army with the aid of French and English subsidies, but was defeated by Wallenstein at Dessau in 1626. Having raised another army, he marched into Hungary to join Bethlen Gabor, but died suddenly near Serajevo. It was he who introduced the custom of quartering troops upon the country they occupied.

Mansfield, town, England, in Nottinghamshire. It has a handsome 13th century church. In the vicinity are Newstead Abbey and Hardwick Hall; p. 46,975.

Mansfield, Katharine (1891-1923), English author, was born in Wellington, New Zealand. Her first work worthy of note was a series of book reviews in *The Nation* and *Athenæum* about 1919. Her other published works include *Bliss and Other Stories* (1920), *The Garden Party and Other Stories* (1922), and *The Dove's Nest* (1923). Her premature death cut short the career of a writer of great promise.

Mansfield, Richard (1857-1907), American actor, was born on the island of Heligoland, Germany. In 1882 he appeared at the Standard Theater in New York City, and the following year made a sensation at the Union Square Theater by the graphic force of his Baron Chevrial, an elderly *roué* in the *Parisian Romance*, an adaptation from the French. From 1883 until 1890 he played in the chief cities of the United States winning respect by work that ranged from Ko-Ko in *The Mikado* to Richard III. and Shylock. The wide range of his work, its serious quality, and marked intellectual significance won him high rank in his profession.

Mansion House, London, the official residence of the lord mayor built between 1739 and 1753.

Manslaughter, the unlawful killing of another without malice aforethought. Manslaughter is either voluntary or involuntary. Voluntary manslaughter occurs when, upon

a sudden quarrel, two persons fight and one kills the other, or when a man greatly provokes another by some personal violence and the other immediately kills him. Manslaughter is a felony, and in both England and the United States is punishable by penal servitude for life, or by imprisonment, or fine, or both. See HOMICIDE; MURDER.

Mansurah, capital of the province of Dakiyeh, Lower Egypt, near the west shore of Lake Menzaleh. It is a center of the cotton industry; p. 40,300.

Mantegna, Andrea (1431-1506), Italian painter and engraver, born at Vicenza. The epoch of art from the middle of the 15th to the early part of the 16th century in Northern Italy found its highest expression in him and is therefore commonly called the Mantegnesque. He was the pupil of Squarcione, and was influenced also by Donatello and Jacopo Bellini. Of his early paintings, the most important are the Eremitani frescoes at Padua, the *Agony in the Garden* in the National Gallery, London, and the triptych in the Uffizi Gallery, Florence.

Mantell, Robert Bruce (1854-1928), Br.-Am. author, born Irvine, Scotland; first played with Boucicault, later with Modjeska and Fanny Davenport; became a popular actor in Shakespearean roles.

Mantes, town, department Seine-et-Oise, France, on the Seine. Its fine Gothic church of Notre Dame dates from the 12th century; p. 8,500.

Manteuffel, Edwin Hans Karl, Baron von (1809-85), Prussian field-marshal, was born at Dresden, and entered the Prussian service in 1827. He precipitated the war over Schleswig-Holstein by marching his men into Holstein as a Prussian protest against the summoning of the estates (1866). He became commander-in-chief of the Army of the Main, and defeated the Bavarians in various battles. When the Franco-German War broke out he succeeded in driving 80,000 French soldiers into Switzerland. Subsequently he became (1879) governor of Alsace-Lorraine.

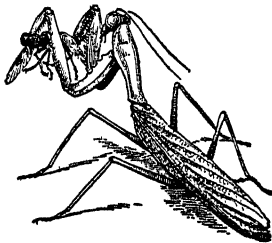
Mantineia, city of Arcadia in ancient Greece. Two great battles are known by its name: the first in 418 B.C., when the Spartans defeated the Argives, Arcadians, and Athenians; the second in 362 B.C., when the Thebans defeated the Spartans.

Mantis is the name of members of the insect family Mantidæ, widely distributed over the warmer parts of the globe, of which perhaps the most familiar member is the 'praying mantis' (*M. religiosa*) of Europe.

Mantling. See **Heraldry**.

Mantras, in Hinduism, extracts from the Vedas. In the degraded form of Hinduism they are used as mysterious spells for the purpose of working magic or of averting evil.

Mantua (Italian *Mantova*), city, capital of province of same name, Lombardy, Italy, on the Mincio, 22 m. s.w. of Verona. The city is strongly fortified, the river, artificial lakes, and canals forming part of the scheme of defence. There are Renaissance churches, the



Mantis (Hierodula raptoria).

most important being that of Sant' Andrea, and the town possesses art treasures of Mantegna and Giulio Romano. It was the native town of Virgil, and there is a Virgilian academy; p. 36, 257.

Manu, a mythical Brahman sage, supposed to have lived about five centuries before Christ. He is the reputed author of the code which bears his name, though it is clear that the book is the work of more than one man. The *Code of Manu*, which was elevated to the dignity of sacred literature long before it came to be adopted as the basis of Hindu jurisprudence, is a philosophical treatise on the religious and social obligations of the Aryan race.

Manual of Arms. When the military recruit has made fair progress in learning the 'position of the soldier' and the various steps, he is furnished with a rifle (or carbine) and taught its nomenclature, use, care, and preservation, all of which constitute the manual of arms, as set forth in the drill regulations of the several branches of the service. See **DRILL**, **MILITARY**.

Manual Training. This term has come to be accepted as denoting that training of hand and eye and mind which is not primarily vocational in character, but which has been introduced into school work in order to give the pupil a better understanding of industrial life through typical forms of constructive activity, and to supply a means of expression essential to normal child life. In American

usage there is a growing tendency to differentiate sharply between manual training as a feature of general education and specialized instruction given to selected groups for distinctly vocational ends. (See **INDUSTRIAL EDUCATION**.)

The manual-training movement began in America with a strong emphasis on drawing as an art to be taught in the schools. In 1880, through the efforts of Dr. Calvin A. Woodward, the St. Louis Manual Training School was opened in connection with Washington University. The work of this school attracted wide attention, and its success led to the early organization of similar schools in other large cities. The rapid development of this type of secondary education, which continued for a number of years after its inception, has resulted in an institution peculiarly American. Such schools have occupied a somewhat indefinite educational status, standing as they do midway between general and vocational schools, and a tendency has become apparent of late years to intensify the industrial side of the curriculum, and to transform such schools into recognized technical schools.

The introduction of manual training in the elementary schools came more slowly than in the high schools. From the upper grades handwork in various materials gradually made its way downward in the school, until manual training in some form has come to be represented in many progressive cities in every class of the elementary school. See **INDUSTRIAL EDUCATION**; **TECHNICAL EDUCATION**.

BIBLIOGRAPHY.—*Proceedings of the National Education Association*; Salomon's *Theory of Educational Sloyd* (1896); Dewey's *School and Society* (1899); *Proceedings of the Eastern Manual Training Association* (1900-1908); *The Place of Industries in Education* (National Education Association, 1910).

Manuel II. (or **Manoel**), Ex-King of Portugal (1889-1932), continued the dynasty of Braganza, which dated from the close of the 14th century. He ascended the throne on Feb. 2, 1908, immediately after the assassination of his father and elder brother, he himself being slightly wounded in the attack. In 1910, with the co-operation of the army, a republic was established, and the young King, with his family, was forced to flee the country. They took refuge in England. See **PORTUGAL**.

Manufactures, United States. See **United States, Manufactures**.

Manumission, release from bondage, a term used especially in connection with slavery in Rome. Slaves could be manumitted formally in the presence of a magistrate and witnesses; or informally, without official sanction. Consult Buckland's *Roman Law of Slavery* (1908).

Manures. See Fertilizers.

Manuscripts. The earliest specimens of manuscripts occur upon stone, metals, wood, baked clay, wax, linen, bark and leaves of trees, and prepared skins of quadrupeds, such as goats, sheep, and calves. The present article is restricted to writings on vellum or parchment—i.e., manuscripts proper. Vellum is prepared from the skin of the calf, parchment from that of the sheep. In the earlier centuries, schools or associations of scribes existed. To one of these schools at Alexandria we are indebted for the famous copy of the Scriptures known as the *Codex Alexandrinus*, written at the commencement of the 5th century, and now in the British Museum. The oldest manuscript known is the *Papyrus Prisse*, in the Louvre at Paris, consisting of eighteen pages in Egyptian hieratic writing, ascribed to about B.C. 2500. The oldest Greek writing (not inscription) is on a papyrus at Vienna, assigned to the period 280-70 B.C.; while the earliest Latin document is a wax tablet in the National Museum at Naples, clearly dated A.D. 55. The earliest of Western manuscripts were written in Roman capitals; then followed rustic capitals, the uncial hand (meaning originally letters an inch long); next came the half-uncial, the Merovingian, the Carolingian minuscule, the Hiberno-Saxon, the Roman or continental, the angular Gothic, and the court hands.

In regard to illuminated manuscripts, in the 4th, 5th, and 6th centuries we find little ornamentation beyond the rubricated or gilded letters of the actual text. The 7th, 8th, and 9th witnessed the perfections of the Hibernian style; the 10th, 11th, and 12th, the introduction and use of architectural forms; the 13th, 14th, and 15th, the growth of foliage under carefully studied natural laws—the 13th century being the age of the bud, the 14th of the leaf, the 15th of the flower; and in the miniatures, the 13th the age of gold, the 14th of diaper, the 15th the commencement of realistic painting. See *Books in Manuscript* by E. Madar (1893), and Adler's *About Hebrew Manuscripts* (1905). See also INSCRIPTIONS, Papyrus.

Manutius Aldus, or **Manuzio Aldo** (1449-1515), promoter of typography and

classical scholarship, born at Bassiano, near Velletri; settled at Venice (1490), where he founded the Aldine Press. There he published the Aldine editions of the classics, which for typography and accuracy have ever commanded the admiration of all bibliophiles.

Manzanita, beautiful aromatic flowering shrubs or small trees (*Arctostaphylos*), of the Pacific slope. The roots and knots are utilized as walking-sticks and as veneer. The wood is fine-grained, of a dark red or mahogany color, but twisted and crooked in form.

Manzoni, Alessandro (1785-1873), Italian writer and chief of the romantic movement in Italy, was born at Milan. The great historical novel, *I Promessi Sposi* (1827, best critical ed. by Petrocchi, 1893-1902), written on the model of Scott's works, depicts the state of Lombardy about 1630.

Maoris, aborigines of New Zealand. They are of the Polynesian race, their nearest kin being the Rarotongans of the Cook archipelago; but in physical and mental characters the Maoris differ in a marked degree from all the other members of the Polynesian family. The Maoris have steadily declined in numbers and are mainly confined to North Island, where they have made some progress in the European arts and embraced various forms of Protestant Christianity. See F. E. Maning's *Old New Zealand Pakeha-Maori* (1884).

Maple (*Acer*), a genus of trees belonging to the order Aceraceæ, and containing nearly a hundred species, native to the North Temperate Zone. Maples are especially abundant in North America and Japan. They bear opposite, lobed or palmate leaves, and flowers in axillary racemes, followed by winged fruits. The Sugar Maple abounds in the northern part of the United States, where large quantities of maple sugar are made from its sap. The wood of the sugar maple is white when freshly cut, but becomes yellow. Certain varieties, with undulating grain, or a spotted grain ('bird's-eye maple'), are especially valuable.

The Red, Scarlet, or Swamp Maple is an excellent shade tree, and while softer than the sugar maple, its wood is used for much the same purposes. Other species are the Silver Maple; the Box Elder; the Sycamore.

Mapleson, James Henry (1830-1901), British impresario, was born in London. He introduced Patti, Albani, and other operatic stars to American audiences.

Maps and Map Making. A map is a rep-

resentation, on a flat surface, of any geographical region or expanse. It shows, by means of lines, symbols, and names, the relative extent and the topographic and other features of the area covered. The earliest map of which there is any record was engraved on a copper plate by Anaximander of Miletus about B.C. 580. Of other cartographers of ancient times may be mentioned Dicæarchus, Posidonius, Hipparchus, Strabo, Marinus of Tyre, and, greatest of all, Claudius Ptolemy, who endeavored to fix the latitudes and longitudes of his chief points. The variety and uses of maps have increased with



2.
Maple (Acer campestre).

1, Flower; 2, fruit.

the progress of civilization, cartography keeping pace with commerce and invention. Owing to the curvature of the earth, it is impossible to represent any portion of it on a flat surface without the adoption of a projection, the extent and location of the territory determining which type of projection is to be used. Most maps contain parallels and meridians so that the exact longitude and latitude of all points may be readily ascertained, and greater accuracy is assured in the preparation of the map. On many maps, the north is at the top, the right is east, the left west, and the bottom south. All maps, prepared with any degree of accuracy, are made to scale. The scale is the expression of the ratio of distance on the ground to the corresponding distance on the map. The only true representation of the earth's surface is on the terrestrial globe. However, this is inconvenient in form and too small in scale

to serve the purposes of maps proper, a series of which on paper form an atlas. A hydrographical map, to represent the seas, coasts, lighthouses, etc., is usually constructed on Mercator's projection, and is named a chart. This projection gives a representation of all the earth on one map. A hollow cylinder is assumed to surround the earth, touching along the equator. All the meridians are projected on to the surface of this cylinder, forming parallels to the generating lines of the cylinder. The circle touching the cylinder all round will be the equator. This projection is useful for showing relative directions on the different sections of the earth—directions of ocean currents, isotherms, etc. In orthogonal projection, the lines are drawn from the points of the figure at right angles to the plane of projection. Conical projection is that used for maps of continents and countries because distortion effects are reduced to a minimum. Topographical maps represent details minutely and on a large scale. Elevation of a country is shown by orographical maps; kingdoms, states, counties, by political maps. Various formations are indicated by geological maps. Air maps make no representation of lands and waters, only the names and location of places.

Maqui, an evergreen Chilean shrub, the only known species of the order Tiliaceæ.

Maraboo Stork, an African stork of the genus *Leptoptilus*, closely allied to the adjutant of India. The soft white tail feathers are extensively used in millinery and for scarfs, muffs, etc.

Marabouts, a sect of religious devotees found chiefly in Northern Africa, who have at times exercised marked political influence.

Maracaibo, city, Venezuela, on the outlet of Maracaibo Lake, third city in population and one of the most important commercial centers in the country. Exports are coffee, cacao, hides; p. 222,613.

Maracaibo, Gulf of, or **Gulf of Venezuela**, is a wide inlet of the Caribbean Sea, connected with Maracaibo Lake. The gulf and lake were discovered in 1499 by Ojeda, who found here houses built on piles, and so gave the district the name Venezuela ('Little Venice').

Maragha, old city, Azerbaijan, Persia. It contains the tomb of the Mongol sovereign Hulagu Khan, who erected on the adjacent mountain a celebrated observatory; p. 15,000.

Marakesh, largest city in the French Zone of Morocco, Africa; p. 191,936.

Maranhão, or **São Luiz de Maranhão**,

capital of the state of Maranhão, Brazil. The chief exports are cotton and sugar; hides, balsam, and india rubber; p. 52,929.

Maranta, a genus of tropical herbaceous plants belonging to the order Scitamineæ. The roots of several species yield arrow-root, that of *M. arundinacea* being called Bermuda arrow-root.

Maraschino, a white liqueur distilled from a cherry grown in Dalmatia.

Marash, tn., vilayet Aleppo, Asiatic Turkey. The principal trade is in Kurd carpets and embroideries. Hittite inscriptions have been found in the vicinity. The town is believed to occupy the site of the ancient Antiochia ad Jaurum; p. 50,000.

Marasmius, a genus of mushrooms, with very tough gills which are not incised. The champignon, or fairy-ring mushroom belongs to this genus. It is of a pale red color with white gills, and is valued as food.

Marat, Jean Paul (1743-93), French revolutionist, was born at Boudry, near Neuchâtel. On the outbreak of the French revolution he wrote several pamphlets, and in September 1789 brought out the first number of the journal *L'Ami du Peuple*. In the Convention Marat represented Paris, and in the struggle between the Jacobins and the Girondists he took a leading part. On July 13 he was murdered by Charlotte Corday, a Girondist enthusiast.

Maratha, Mahratta, or Marhatta, a nationality which came into prominence in India during the reign of Aurangzeb (1658-1707). In 1749 they were the most powerful people in India, where three Maratha states still exist—Gwalior, Indore, and Baroda.

Marathon, tn., Attica, ancient Greece; famous as the scene of the decisive victory gained by the Athenians, under Miltiades, over the Persians in 490 B.C.

Marathon, a name first given in 1896 at the Olympic Games in Athens, Greece, to a long-distance foot race run on the road from Marathon to Athens. Together with other sporting contests of various kinds, it was under the auspices of the International Olympic Committee for the revival of the Olympic Games. The distance was about 26 m. The name 'Marathon' is now given to all the notable long-distance foot races which owe their origin to the race at Athens.

Maravedi, originally a Spanish gold coin; but after 1474 the smallest Spanish bronze coin. It circulated down to 1848.

Marble, in strict usage, designates only those varieties of limestone which have be-

come entirely crystalline by complex processes of metamorphism. The best marbles are invaluable for statuary purposes, the finest of all being that quarried at Carrara in Italy. The ancient Greek sculptors used for their finest work Parian marble and marble of Pentelicus, both white. Marbles are used also in polished slabs for decorating interiors and as building stones. The beautiful Connemara marble and the pinkish Tivoli marble are two real marbles. Vermont is the chief source of marble for the United States. Some marbles are black and some are white, but most of them are variegated.

Marblehead, vil., Mass. It is a quaint old town with colonial buildings and is a pleasant seaside resort. It was settled in 1629 and formed part of Salem for twenty years. It was the birthplace of Elbridge Gerry and Judge Story. The scene of Whittier's poem 'Skipper Ireson's Ride' is laid here. A granite monument commemorates the taking of an English ship by a Marblehead vessel in 1776. The fight between the 'Chesapeake' and the 'Shannon' occurred off Marblehead; p. 10,856.

Marburg. (1) Town, Austria, is the seat of the bishop of Lavant; p. 28,000. (2.) Town, prov. Prussia, contains the 13th-century castle of the landgraves of Hesse, which was the scene in 1529 of the disputation between Luther and Zwingli. It has a university, founded in 1527; p. 26,000.

Marcantonio, or M. Raimondi (c. 1488-c. 1534), Italian engraver, born at Bolognâ. He copied Albert Dürer's works, which he sold as his own. He afterwards became acquainted with Raphael and Giulio Romano, who employed him to engrave their works.

Marcasite, one of the sulphides of iron (FeS₂), occurs as a mineral, and has the same chemical composition as pyrites.

Marcello, Benedetto (1686-1739), Venetian poet and musician, was one of the most original composers of his day. He is known chiefly for his musical settings for Giustini's *Paraphrases of the Psalms* (1724-7), which are among the great compositions of sacred music.

Marcellus, the name of two popes in the Roman Catholic Church. MARCELLUS I. was driven from Rome because of the drastic penances which he imposed upon Christians. MARCELLUS II. took a prominent part in the discussions of the Council of Trent.

Marcellus, the name of an ancient Roman plebeian family of the Claudian clan. MARCUS CLAUDIUS MARCELLUS (c. 268-208 B.C.), was a famous general and was five times con-

sul. Syracuse surrendered to him, after a siege of two years, in 212 B.C., and the remainder of Sicily was soon brought under the dominion of the Romans. **MARCUS CLAUDIUS MARCELLUS** (d. 46 B.C.), distinguished orator and opponent of Julius Cæsar, was consul of 51 B.C. **MARCUS CLAUDIUS MARCELLUS**, son of Octavia, sister to Augustus. Virgil has immortalized him in the *Æneid*.

March, the first month of the Roman year, and the third according to our present calendar, consists of thirty-one days.

March, in music, a form of composition intended to accompany the marching of troops or of any considerable number of persons. The famous Welsh war song, *The March of the Men of Harlech* (1468), is believed to be the earliest known example.

March, a term sometimes used to denote a boundary between adjacent territories, as well as the district lying along such a boundary. It was applied especially, in the Middle Ages, to the border regions of England and Wales and of England and Scotland. Certain noblemen to whom estates on the English frontier were granted, on condition that they defend the country from aggression, were styled *Lords of the Marches*. They were abolished by Henry VIII. and Edward VI.

March, or **Morava**, river, Austria, flows southward, forming the boundary between Austria and Hungary.

March, Alden (1795-1869), American surgeon, born in Sutton, Mass. He invented numerous surgical instruments and wrote *Wounds of the Abdomen and Larynx*. He was a founder of the American Medical Association.

March, Francis Andrew (1825-1911), American philologist and educator, was born in Millbury, Mass. He was a pioneer in the philological study of the English classics, and a leader in the movement for simplified spelling. Dr. March was consulting editor of the *Standard Dictionary* (1890-4). With his son, F. A. March, Jr., he edited *A Thesaurus Dictionary of the English Language* (1903).

March, Fredric (1897-), was born at Racine, Wisconsin. He abandoned a position with the National City Bank in New York when he was offered a role on Broadway by David Belasco. He won the 1932 Academy Award. Pictures in which he has appeared are *Sarah and Son*, *Design for Living*, *The Barretts of Wimpole Street*, *A Star Is Born*. In 1942 he played in Thornton Wilder's successful play, *The Skin of Our Teeth*.

March, Peyton Conway (1864), Ameri-

can army officer, was born in Easton, Pa. Upon the entry of the United States into the World War (1917), he was made artillery commander of the American Expeditionary Forces in France (1917). On March 4, 1918, he was appointed Acting Chief of Staff of the U. S. Army, and on May 20, Chief of Staff.

Marchand, Jean Baptiste (1863-1934), French general and explorer, was born in Thoissey, Ain. He entered the army in 1883 and performed his first notable services in Africa, where his search for a better route between the Gulf of Guinea and the valley of the Niger resulted in the Transnigerian railway scheme. He commanded the French troops which occupied Fashoda in 1898, previous to the defeat of the Dervish troops by Lord Kitchener, and when the latter demanded the withdrawal of the French refused to comply without instructions from the French government. Diplomatic exchanges between Great Britain and France followed, and the French expedition was recalled.

Marchantia, a genus of liverworts, of which a common series, *M. polymorpha*, is often found on moist earth and damp walls.

Marchena, town, province of Seville, Spain. It is a picturesque old town with remains of Moorish fortifications and ruins of the palace of the dukes of Arcos. It is noted for its sulphur springs; p. 15,309.

Marches, district of Italy, including the provinces of Anconia, Ascoli-Piceno, Macerata, and Pessaro e Urbino.

Marchesi, Mathilde di Castrone (1828-1913), née GRAUMANN, world famous teacher of singing, was born in Frankfort-on-the-Main. Madame Marchesi devoted herself to class instruction, and numbered among her pupils such famous singers as Melba, Eames, Calvé, Emma Nevada, Tremelli, and Sibyl Sanderson.

Marchetti, Filippo (1835-1902), Italian musical composer, was born in Rome. His chief operas are *Il Paria*; *Romeo e Giulietta* (1865); *Ruy Blas* (1869).

Marchfeld, plain, n. of the Danube, opposite Vienna, famous as a battlefield. Here, in 1269, Ottokar of Bohemia defeated Bela IV. of Hungary, and in 1278 was himself defeated by Rudolph of Hapsburg. In 1809 the battles of Aspern and Wagram were fought here.

Marchiennes-au-Pont, town, province of Hainault, Belgium. It is situated in a rich coal district and manufactures machinery, iron, and glass; p. 22,000.

Marching, in military parlance, the movement of troops on foot or on horse from one stopping place to another. The order of march is dependent upon so many conditions that it must practically be determined separately for each case, although governed by well recognized principles. In general in tactical marches the main body of the advanced guard is followed by a small body of infantry and cavalry, as a body guard to the commanding general; the artillery, being required to go into action at once on contact with the enemy, marches at the head of the main column, and is followed by the mass of the infantry, infantry ammunition wagons, cavalry, field hospitals, artillery train, bridge train and general train. The prescribed rate for U. S. infantry on ordinary marches is 3 miles per hour, including a halt of ten minutes; the corresponding rate for cavalry and field artillery being 4 miles per hour. Fifteen to twenty miles per day is an average for mixed commands. Consult *Field Service Regulations, U. S. Army* (1914). See also CAVALRY; INFANTRY; ARMY; ARMY IN THE FIELD; SANITARY, MILITARY.

Marchmont, Arthur Williams (1852-1923), English novelist, was born at Southgate, Middlesex. His many works include: *By Right of Sword* (1897); *The Heir to the Throne* (1914); *By Hand Unseen* (1922).

March to the Sea, in the American Civil War, the famous march of General Sherman, at the head of a Federal Army, from Atlanta to Savannah, November-December, 1864.

Marcion (d. 165 A.D.), a heretic of the second century, whose doctrine was largely tinged with Gnosticism, was a native of Sinope in Pontus. He had a considerable following, but the sect seems to have ultimately merged into Manichæism in the sixth century.

Marcomanni, an ancient Germanic tribe who originally dwelt along the Rhine, but who early in the Christian era expelled the Boii from Bohemia and part of Bavaria, and founded a kingdom which reached to the Danube. During the reign of Marcus Aurelius (161 to 180 A.D.) they waged war with Rome, until peace was purchased by Commodus.

Marconi, Guglielmo (1874-1937), Italian electrical engineer, inventor of wireless telegraphy, born at Griffone. In 1899 Marconi established wireless connection between France and England, across the English Channel, and in 1901, across the Atlantic, between Cornwall, England, and St. John's, Newfoundland, a distance of 2,100 miles. In December, 1902,

he made wireless connection between Cape Breton and England, and shortly afterward between Cape Cod (Massachusetts) and Cornwall. In 1907 he fixed a wireless telegraphic connection between America and England for public use. Marconi received the Nobel prize for physics in 1909. In October, 1926, his beam system of radio-telegraphy was tested and was found to speed up the transmission of messages.



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Guglielmo Marconi.

Marcosson, Isaac (1877-), journalist, was born in Louisville, Ky. He was editor of the *Louisville Times*; associate editor of *World's Work*; financial editor of the *Saturday Evening Post*; and associate editor of *Munsey's Magazine*. Among his works are *The War after the War* (1916); *The Rebirth of Russia* (1917); *Caravans of Commerce* (1927).

Marcy, Mount, the highest peak in the Adirondacks, in Essex co., New York, with an altitude of 5,344 ft.

Marcy, William Learned (1786-1857), American public official, was born in Southbridge, Mass. He became adjutant-general of the state militia in 1821, state comptroller in 1823, justice of the Supreme Court in 1829, and U. S. Senator in 1831. While defending Van Buren on the question of his confirmation as minister to England, he used the words 'to the victor belong the spoils of the enemy.' He was governor of New York for three terms, and became secretary of war in 1843.

Mardin, tn., Asiatic Turkey. It is the seat of an American mission; p. 22,249.

Mardonius, Persian noble, son-in-law of Darius. After Xerxes' retirement he com-

manded the Persian army left in Greece, which captured Athens a second time in 479 B.C.

Marengo, vil., near Alessandria, Italy. Here Napoleon, on June 14, 1800, completely defeated the Austrians under Melas.

Mare's-tail, a tall marsh-plant, with whorls of narrow leaves.

Margaret (1353-1412), queen of Denmark, Sweden and Norway. She assisted the Swedes to expel their unpopular king, Albert of Mecklenburg; was elected queen; and in 1397 united all three kingdoms into one monarchy by the union of Kalmar. She was called the Semiramis of the North.

Margaret of Anjou (1430-82), queen consort of Henry VI. of England. Owing to Henry's imbecility, Margaret's authority was supreme. She strove to uphold the rights of her son Edward in the wars of the Roses.

Margaret of Navarre (1492-1549), was born in Angoulême, the daughter of Charles of Orleans. She was a patroness of science and arts, and exercised her influence in favor of toleration. Her literary fame rests on the *Heptaméron des Nouvelles*, which is modelled after the *Decameron* of Boccaccio.

Margaret of Parma (1522-86), a natural daughter of the Emperor Charles V. She was created governor of the Netherlands (1559-67), but her severity drove them into rebellion.

Margaret of Valois (1553-1615), a daughter of Henry II. of France and Catherine de' Medici. She was the last of the house of Valois, and the writer of *Mémoires* (1628; new ed. 1872).

Margaret, St. (?1045-93), queen of Scotland, born in Hungary, the daughter of Edward the Exile of England. Margaret did much to civilize Scotland by introducing various religious customs, the observance of Sunday, and stricter marriage laws; while her charity to the poor was unbounded. She was canonized (1250).

Margaret Tudor (1489-1541), daughter of Henry VII. of England, born at Westminster. Her marriage to James IV. of Scotland (1503) brought about the union of England and Scotland.

Margate, munic. bor., wat.-pl., and seapt., Kent, England; has a sea-front of nearly three miles, and is noted for its health-restoring air. During the World War, the town was constantly raided by German air-craft going to or returning from London; p. 31,312.

Margay, a small spotted wildcat of forest regions from Mexico to Paraguay.

Marggraf, Andreas Sigismund (1709-82), German chemist, born at Berlin; noted for his discovery of cane sugar in beetroot.

Margin, a term used in monetary transactions to indicate the difference between the market value of the securities deposited to cover a loan and the actual advance made, such as is involved, for example, in the purchase of stocks and bonds, wheat, cotton or other commodity. This difference is to allow for possible depreciation of the securities or of the commodity and the amount of it will depend on the nature of the securities or commodity and of their general liability to sudden fluctuations without warning.

Margrave, originally the governor of a march or frontier district, such as the Germans held against the Slavs and the Magyars. These officers were first appointed in the time of Charles the Great, but eventually the title was divorced from the office and became a title merely.

Marguerite. See *Chrysanthemum*.

Maria Christina (1806-78), queen of Spain, was the daughter of Francis I. of Naples, and in 1829 was married to Ferdinand VII. of Spain. After his death, in 1833, she ruled as regent for her daughter Isabella, but resigned in 1840 in consequence of popular disturbances aroused by the Carlists.

Maria Christina, queen and queen-regent of Spain (1858-1929), born of the Austrian royal family, and married to Alfonso XII. of Spain. During the minority of her son, who became king in 1902 as Alfonso XIII., she was queen-regent.

Mariana, Juan (1536-1624), Spanish historian, born at Talavera. His *History of Spain* was published in Latin (1592), and in Castilian (1601). The style is fresh and charming, and the work remains a classic.

Maria-Theresa (1717-80), queen of Hungary and German empress, was daughter of Charles VI., and was born at Vienna. For nearly thirty years (1713-40) it was her father's endeavor to secure for her, as he did by the Pragmatic Sanction, the right of succession to the imperial crown. She married Francis of Lorraine, whom she nominated joint-regent with herself. Her succession was challenged and the war of the Austrian succession (1740-48) ensued. Silesia, during the struggle (1742) was taken by the Prussians, and this gave rise fourteen years later to the Seven Years' War. In 1772 Poland was partitioned by Catherine II. of Russia, Frederick of Prussia, and Maria Theresa, who acquired Red Russia (Galicia).

Mariazell, t.n., duchy of Styria, Austria, has a shrine of the Virgins, which attracts 200,000 pilgrims annually; p. 1,341.

Marie Antoinette, Joseph Jeanne (1753-93), queen of France, wife of Louis xvi., daughter of Francis I. and Maria Theresa, was born at Vienna. Becoming queen of France in 1774, her influence over Louis xvi. was great but profitless; she thwarted him in his wish to yield reform, and urged him to absolutism. Disliked by the courtiers, she by her unpopularity helped to ruin the royal cause. Still she faced the mob of women at Versailles (October 5 and 6) with splendid courage; and after the flight to Varennes (1791) she accompanied Louis to the Assembly, and later to the Temple, where her fortitude and patience equalled her previous bravery. Accused before the revolutionary tribunal of intriguing with the enemies of France and of stirring up civil war, she was condemned and executed (October 16, 1793).

Marie de France, Anglo-Norman poetess of the 12th century. Her works include a collection of Breton *Lais*, and translations of *The Fables of Æsop* and the *Purgatory of St. Patrick*.

Marie de' Medici (1573-1642), daughter of Francis, grand-duke of Tuscany, married (1600) Henry iv. of France. After the murder of her husband by Ravaillac, she was appointed queen-regent, but allowed herself to be governed by two Florentine adventurers, Concini and his wife Leonora, until the young king, Louis xiii., caused Concini to be assassinated, and exiled Mary to Blois, whence she made her escape to Angoulême in 1617.

Marie, Dowager Queen of Rumania (1875-1938), dau. of the Duke of Edinburgh second son of Queen Victoria. In 1893 she married Prince Ferdinand, afterwards King of Rumania. Six children were born of this marriage, of whom the older son was crowned Carol ii., King of Rumania, 1930. Queen Marie was active in promoting Rumania's welfare. She formed Red Cross and charity organizations and was a Red Cross nurse during the World War. She devoted much of her time to writing, and her published works include *The Lily of Life* (1913), *My Country* (1916), *Stealers of Light* (1916), *Ilderim* (1925), *The Story of My Life* (1934). She wrote extensively for the American and other press.

Marienburg, wat.-pl. (since 1808), Bohemia, Austria. Its springs vary in temperature

from 48° to 53°. Salt and mineral waters are exported; p. 7,000.

Marienburg, t.n., prov. W. Prussia, Prussia. Its fine castle, dating from the 14th century, was the seat of the grand master of the Teutonic order, and belonged to the Teutonic knights until 1457; p. 21,000.

Marietta. (1.) City, O. The district is rich in minerals, having deposits of coal, iron, petroleum, etc., and natural gas. It is the seat of Marietta College; p. 14,285. (2.) City, Ga. Kenesaw Mountain, where Sherman met with his only reverse in the Atlanta campaign, lies 2 m. w. of the city; p. 14,285.

Marietta College, a non-sectarian coeducational college at Marietta, Ohio, chartered in 1835. The college library is especially strong in the history of the old Northwest Territory.

Mariette, François Auguste Ferdinand (1821-81), French Egyptologist, was born at Boulogne. He dug out the Sphinx, and excavated Meydum, Gizeh, Abydos, Karnak, etc., and began the excavation of Tanis. He founded in 1863 the Bulak Museum near Cairo, and the Egyptian Institute, and published many books.

Marigold, a name given to several quite distinct flowering plants. The marsh marigold, which produces its handsome rich yellow cups in spring, is *Caltha palustris*. The half-hardy French and African marigolds of gardens are varieties of the genus *Tagetes*, having yellow, orange, and brown flowers of rank odor. The old marigold, or marygold of English poets and herbalists, is a hardy annual plant, *Calendula officinalis*.

Marine Biological Research. The results obtained during the oceanic telegraph surveys led to the equipment of expeditions especially for deep-sea research. The most notable of these was that of the *Challenger* (1873-6), under Sir Wyville Thomson. Great attention has been given to scientific investigations connected with fisheries. The objects of marine biological research are twofold—to increase our knowledge of the natural history of living beings; and to ascertain the conditions which influence the sea fisheries. In fisheries research, attention is mainly directed to the natural history of fishes, their migrations, reproduction, food, growth, the nature of their eggs, and the causes of fluctuations in their abundance. In both branches of research the physical phenomena of the sea, such as depth, temperature, currents, salinity, which influence marine life, are also studied: this branch is termed hydrography. All ani-

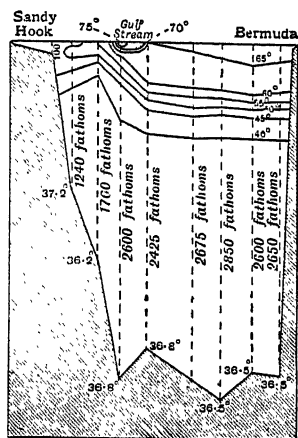
mal life in the sea depends ultimately upon plants or vegetable life; but plants are scarcely represented beyond a depth of 50 fathoms, and they are quite absent below 200 fathoms.

On the other hand, everywhere at the surface, over all the ocean, and within the limit of the light zone, multitudes of minute plants exist, such as diatoms; these form the food, directly or indirectly, of the animal life which is present in the surface waters. The animals in the deep water—which forms by far the greater portion of the ocean—must therefore be carnivorous; and nearly all marine

of reproduction is determined, occurring in temperate latitudes in spring and summer, as with birds. In the abysses of the ocean, on the other hand, the water is shrouded in perpetual night, is icily cold, and is almost absolutely still. Nevertheless, the depths of the sea are peopled with a rich variety of animal life—fish, echinoderms, molluscs, crustaceans. The fish, as a rule, are dark colored or quite black, but sometimes they are silvery; the invertebrates may be brilliantly colored—red, yellow, purple, green, but never blue. Many of them are blind. The fish living in the lesser depths, where a glimmering twilight may be supposed to prevail, have usually exceedingly large eyes but in the abysses the eyes are usually extremely small. A proportion of the deep-sea fish are furnished with luminous phosphorescent organs by which they can manufacture light for themselves; some invertebrates are similarly endowed. The fish of the deep sea are remarkable, as a rule, for the great relative size of their jaws and the formidable armature of teeth.

Marine City, city, Michigan. The salt deposits are said to be 95 per cent. pure; and more than 30,000 tons of salt are shipped yearly. The place is noted for its mineral waters; p. 3,633.

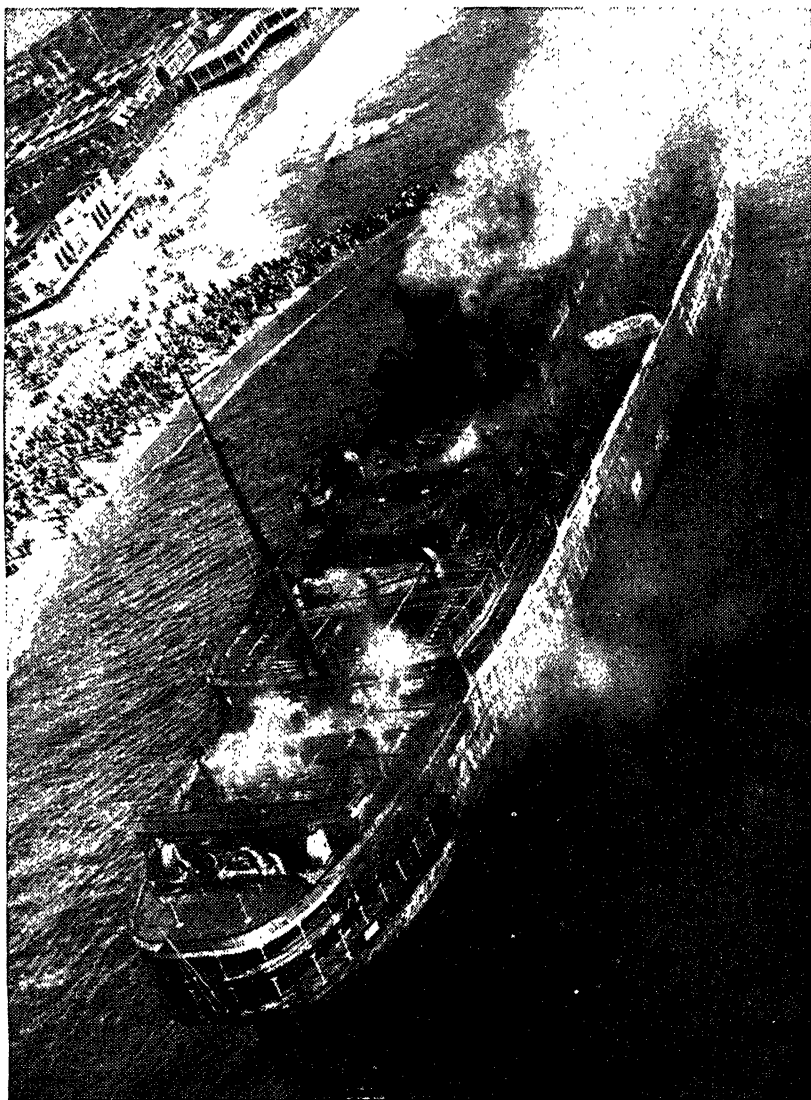
Marine Corps, a body of men trained as infantry and artillery soldiers, which usually forms part of the naval service. In the United States, the Marine Corps is an independent branch of the military service, under a Major General Commandant; it is generally subject to orders of the Secretary of the Navy but it may be detached for service with the Army by order of the President. Its duties include service on board vessels of the fleet, in which case the marine detachments are organized as gun divisions, constituting a part of the ship's fighting forces; service as technical organizations for advanced base work, and as mobile organizations for supporting the fixed defence forces of advance bases, and for expeditionary duty; service as guards for navy yards, radio stations, and naval magazines in the United States and elsewhere, and as guardians of American interests and legations in foreign countries in times of disturbance. In 1775 the Continental Congress authorized the organization of two battalions of marines, which served through the Revolution. These were disbanded following the close of the war, and the Corps was reorganized and



Temperature Curves for part of the North Atlantic.

fishes are carnivorous. From the restricted penetration of light, it also follows that the deeper waters are cold compared with the surface. The temperature varies with the latitude and season as well as with the depth. In the Red Sea the temperature twenty feet below the surface may exceed 90° F. for several months in the year, and has an annual average of over 80° F., in the British seas the annual average ranges about 50° F., and the maximum about 60° F., while on shallow beaches it may vary from 90° F. in summer to freezing point in winter. In the open sea, even in the tropics, the temperature a few hundred fathoms below the surface is greatly reduced, and is almost constant, while at the bottom it is always close to the freezing point.

The influence of these conditions on animal life is profound. Many animals migrate as the temperature varies, sometimes with as close a relation to the variation as is shown by migratory birds, while the period



The Morro Castle, on fire. Airplane View.

permanently established in 1798 (July 11). It rendered distinguished service in the War with Tripoli, in the War of 1812, and in the Civil War. During the Great War (1914-18) the U. S. Marine Corps won imperishable glory on the battlefields of France as a part of the American Expeditionary Forces under General Pershing. They halted the German drive on Paris by their gallant action at Château Thierry and in Belleau Wood

(June-July, 1918). In World War II the Marine Corps rendered distinguished service, especially in the Pacific.

Marine Disasters, casualties at sea usually caused by collision, foundering, fire, or stranding. During recent years the rapid increase in the size and speed of vessels has raised the limit of life and property loss to serious proportions. The first great naval disaster of Christian times of which a fairly

reliable record has been preserved is the destruction of the Spanish Armada in 1588. Notable among marine disasters of the nineteenth century was the wreck of the French ship *La Méduse* off the coast of Africa on July 2, 1816. In 1867 the Royal mail steamers *Rhone* and *Wye*, with about 50 other vessels, were driven ashore by a hurricane on the island of St. Thomas, West Indies, and about 1,000 lives were lost. One of the worst collisions at sea was that between the French liner *La Bourgogne* and the British ship *Cromartyrshire* on July 4, 1898, about 60 miles off Sable Island. A dense fog prevailed and *La Bourgogne* sank in ten minutes. Of her passengers and crew of nearly 750, only 166 were saved by the *Cromartyrshire*.

One of the most terrible disasters on inland waters was the destruction by fire of the excursion steamer *General Slocum* in the East River, New York, on June 15, 1904, in which 960 persons, mostly women and children, were either burned to death or drowned. Another disaster, of almost equal proportions, was the sinking of the excursion steamer *Eastland* at her dock in Chicago, on July 24, 1915, with a loss of 852 lives. Perhaps the gravest marine disaster of modern times was the sinking of the giant White Star liner *Titanic* on April 14, 1912, after collision with an iceberg in the Atlantic. The number of persons on board was placed at 2,208, and of these it is estimated that 1,503 were lost. One of the most serious marine disasters on record occurred Dec. 6, 1917, in Halifax harbor (Nova Scotia), when the French munitions ship *Mont Blanc* bound from New York to Halifax was crashed into by the Norwegian ship *Imo* in the Belgian relief service. The inflammable nature of the *Mont Blanc's* cargo caused a terrific explosion which laid waste a large section of the city of Halifax.

On September 8, 1934 occurred the Morro Castle disaster. Six miles off the New Jersey coast, fire broke out in the ship in early morning and caused a loss of 135 lives. The vessel was beached at Asbury Park. After an investigation, her master was indicted on charges of negligence. Feb. 9, 1942 the French liner *Normandie* burned at her pier in New York City, then turned on her side and lay partially submerged on the river bottom. In the summer of 1943, after the greatest salvage job of all time, she was at last upright.

Marine Engines. See **Steam Engine; Turbines, Steam; Motor Boats.**

Mario, Giuseppe (1808-83), Italian tenor.

In 1838, as Robert in *Robert le Diable*, he achieved the first of a long series of operatic triumphs in Paris, London, St. Petersburg, and the United States. His repertory included all the great works of Rossini, Bellini, Donizetti, and Verdi.

Mariolatry, a term used by Protestants to designate the religious veneration paid to the Virgin Mary by Roman Catholics.

Marion, city, Ohio. It is an important railroad point, and the trade center of a rich agricultural district. Marion was the home of President Warren G. Harding; p. 30,817.

Marion, Francis (1732-95), American Revolutionary soldier, was born in Winyah, near Georgetown, S. C. He was appointed a major and made one of the defenders of Fort Sullivan (afterward Fort Moultrie). He shared in the patriotic victory at Charleston (June 28, 1776), and was made lieutenant colonel in the regular army. In 1780 Marion was commissioned brigadier general of State troops by Governor Rutledge, and organized a band of irregular cavalry, which had its headquarters in the forests and swamps. With the members of this band, the famous 'Marion's Brigade,' Marion made quick dashes, cut off British detachments, interrupted communications, and punished or overawed the Tories, winning from his British pursuers the sobriquet, the 'Swamp Fox.' At the Battle of Eutaw Springs he commanded the first line of battle and received the thanks of Congress for his gallantry. After the Revolution, Marion was a member of the South Carolina Constitutional Convention. He exhibited unusual talent for organization, was greatly admired as a leader, and ranks as one of the heroes of the Revolution.

Marionduque, or **Marinduque**, island and province, Philippine Islands. The position of Marionduque near the local trade routes between Manila and other parts of the Archipelago has made its bays frequent ports of call; p. 60,000.

Marionettes, a name originally applied to little images of the Virgin, but generally used of jointed puppets worked by hidden actors in miniature theaters. The word in this sense occurs first in Guillaume Boucher (1584). Figures with jointed limbs have been discovered in tombs in Egypt where they were used in the feasts of Osiris. They were known in Etruria, Rome, Greece, India, Burma, China, and Java. In the Middle Ages they were employed to enact mystery and morality plays. Introduced from Italy to France (under Charles ix.), and then to Eng-

land, they are alluded to by Chaucer, Shakespeare, Jonson, Pope, *The Tatler* (1709), and *The Spectator* (1711). Bartholomew Fair was famed for them. George Sand had a theater for them at her castle of Nohant. In the United States, in some of the larger cities may be found small theaters where performances of marionettes are given. See PUNCH AND JUDY.

Mariposa Grove, a State park in Mariposa co., California, containing two fine groves of Sequoia. The largest of these trees is 94 ft. in circumference; the tallest, 272 ft. in height. The principal road passes through one of the trees, and is here 9½ ft. in width.

Mariposa Lily. See *Calochortus*.

Maris, three distinguished Dutch painters, brothers—JACOB (1837-99), MATTHEW (1839-1917), and WILLELM (1844-1910) — whose work in landscape was founded on the Barbizon school. Jacob, born at The Hague, is considered one of the greatest depicors of Dutch landscape and life since Rembrandt. His extraordinary talent was recognized in Great Britain, America, and France before he was appreciated at home. Matthew is the poet dreaming in color, poetic and individual. Willelm was a landscape painter, depicting luminous, cheerful aspects. Their works repose at Amsterdam, The Hague, in the Metropolitan Museum of Art, and in private collections in the United States. Consult D. C. Thomson's *The Brothers Maris* (1907).

Marists, a Roman Catholic religious order, so called for its special devotion to the Virgin Mary. It was founded in France by Jean-Claude-Marie Colin (1790-1875), and was approved by Pope Gregory xvi. in 1836. Its membership consists of both priests and lay brothers, and its work includes home and foreign missions, secondary and college education, and the training of priests. It has two training houses and four colleges in the United States. The *Marist Brothers*, or Little Brothers of Mary, is a separate institute, founded in France in 1817 by Marcellin Champagnat, and devoted to educational work.

Maritime Alps, a portion of the Alps extending from the Col de Tenda (s.e.) to the Col d'Argentière (n.w.) See ALPS.

Maritime Law includes all laws, public or private, international or municipal, which govern or relate to commerce and navigation upon the high seas or other navigable waters. Each nation has its own system of maritime law for the government of its water-borne commerce, and there are very considerable

differences in methods and applications as well as in details. Some of these have been adjusted by treaty, and others by mutual agreement of the private commercial interests, but enough remain to hamper and obstruct trade; and an international committee has long been in existence whose principal duties are to bring into accord the practices of maritime commerce, and to promote treaties and secure such legislation in the various countries as may be necessary for attaining the end in view. Many of the sources of modern admiralty or maritime law are very old, and others date from the early Middle Ages. The most ancient of which we have definite knowledge are the laws of Rhodes, which date from the eighth or ninth century B.C., and were subsequently embodied in the Roman civil law. In Great Britain, maritime law was formerly administered by the High Court of Admiralty, but this was, in 1875, merged into the High Court of Justice. In the United States, by an express provision of the Constitution, the Federal courts have jurisdiction in all admiralty and maritime cases, both civil and criminal; but this is not exclusive of the right of the suitor to seek his remedy in common law in the State courts. In England, maritime law jurisdiction covers tidal waters only, but in the United States it is extended over all navigable waters on which foreign commerce can be directly carried.

Maritime law prescribes and limits the authority of the master of a vessel. He has absolute authority over all on board, both members of the crew and passengers. He must maintain order, obey the law, and compel others to do so. He may put in irons or otherwise confine any one who refuses to obey a reasonable command, or whom it is dangerous to allow to remain at large. To suppress mutiny he may even take life. His action in any case may of course be made the subject of inquiry upon the arrival of the ship in port; and if he has exceeded his legal powers, he may be punished therefor. If necessary to do so, and he cannot communicate with the owners, he may sell the ship and give absolute title to the purchaser; or he may bond the ship to secure funds to pursue his voyage or repair damages. His control of the crew as regards personal treatment, enrollment, discharge, payment of wages, supply of food, character of quarters, etc., is defined and limited by statute. He is responsible to the owners for the safety of the vessel, her careful navigation, and the

proper handling of vessel and cargo; and is responsible to the law that all required provisions are made to secure safety of life at sea. Maritime law also takes cognizance of all matters pertaining to loading, charter, afreightment, demurrage, wharfage, etc., and of questions arising under them; also of insurance, salvage, loss of cargo or of vessel, and damages of all sorts.

If any person or persons save a ship from fire, foundering, stranding, or other perils of the sea, they are entitled to a certain proportion of her appraised or salable value. Salvage rarely exceeds one-half of the value; but in the case of certain derelicts, seven-eighths have been awarded by the courts. When prizes are taken in time of war, the legality of the capture is examined and passed upon by the maritime law courts, and the vessel does not become the property of the captor nation until she has been declared by the court a legal prize. In England, and in most other countries, one-half or more of the proceeds of sale is divided among the officers and crew of the captor vessel, according to fixed rules which make each one's share nearly in proportion to his pay. In the U. S. Navy, prize money was abolished by the Act of March 3, 1899, which gave an increase of pay to all officers and men in lieu of it. In the World War, many considerations of international maritime law were raised, most of them still unsettled. The freedom of the seas to merchant vessels in time of war is still an open question. The United States has always held that all private property at sea was exempt from capture. This standpoint was embodied in one of Wilson's Fourteen Points, but tacitly abandoned after protests by the Allies. The impracticability of the old close blockade led to a new interpretation of when blockade is effective. German use of the submarine flaunted the old laws concerning the capture of ships at sea, according to which the crew and passengers of the captured vessel must be removed to safety if it is sunk. Efforts to outlaw the submarine have been made.

Maritime Province, formerly a province of Russia in East Siberia, now a part of the Far Eastern Area, a unit of Soviet Russia's Asiatic territory.

Maritime Provinces, a general name for the Canadian provinces on the Atlantic Coast—Nova Scotia, New Brunswick, and Prince Edward Island.

Maritza, (Latin, *Hebrus*), river of the Balkan Peninsula, rises in the Rhodope Moun-

tains, flows e. by s. past Philippopolis to Adrianople, where it bends and flows s. by w. to the Gulf of Enos in the Ægean Sea. Length, 300 m. Navigable for small boats up to Adrianople, 100 m. from its mouth.

Mariupol, a seaport of the Ukrainian S. S. R., at the mouth of the Kalmius. Its harbor is four m. s.w. of the town. It has smelting, graphite, and fish-curing establishments, knitted goods factories, and exports iron, coal, oilcake, and grains; p. 40,825.

Marius, Gaius (Caius) (155-86 B.C.), Roman general, was born at Cereatæ, near Arpinum. He served under Scipio Africanus the Younger at the siege of Numantia (134 B.C.), and became tribune of the Commons (119). In 115 B.C. he was prætor, and as prætor the next year did good service in Spain. The threatened invasion of the Cimbri and Teutones caused him to be elected consul every year from 104 to 100 B.C. In 102 he destroyed the Teutones at the battle of Aquæ Sextiæ, and in 101 annihilated the Cimbri on the Raudian plains. He was declared the savior of the state and the third founder of Rome. He was seven times elected Consul of Rome. See SULLA.

Marjoram, the popular name for a number of aromatic herbs, constituting the genus *Origanum*. *Sweet Marjoram* (*O. majorana*) is a perennial plant native to the Mediterranean region, commonly cultivated as an annual, and frequently known as Annual Marjoram. It is an erect, branching plant with grayish green, rounded leaves and clusters of small whitish flowers.

Mark, the standard weight in the monetary system of various European countries at various times. Since 1873 it has been the standard of currency in Germany. It is the equivalent of 100 pfennigen. (For the decline in value of the German mark, see GERMAN.)

Mark, or **John Mark**, a companion of the Apostle Paul, and by unvarying tradition from the close of the second century, the author of the second gospel. He was the cousin of Barnabas the Levite, and the house of his mother Mary in Jerusalem seems to have been a resort of the disciples of Jesus. He accompanied Paul and Barnabas on their first missionary journey. Some years afterward he was with Paul in Rome.

Mark, *The Gospel According to*, the second book of the New Testament. It makes more of the acts of Jesus than of His utterances, and its terse diction and vivid and realistic narrative, added to the fact that it is prob-

ably the earliest of the four gospels, give it a unique character and value. See *GOSPELS*. Consult Bruce (*Expositor's Greek Testament*), and Salmond (*Century Bible*); E. D. Burton's *Studies in the Gospel According to Mark*.

Mark Anthony. See **Antonius, Marcus.**

Market, place in which goods are bought and sold, usually occupying a public space or building; in a broad sense, the condition of trade as the result of supply and demand. Retail markets are usually local in character, while wholesale markets are generally national or international in scope. Stock exchanges afford the best examples of highly organized markets; while the dealings in some important commodities—corn, copper, cotton, iron, and sugar—are also of the highly developed market type.

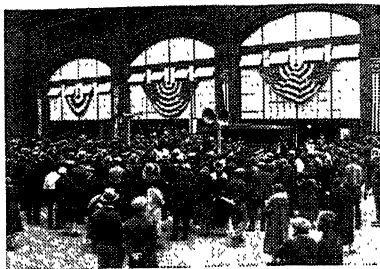
Markets, Public, places where producers and consumers meet directly for the sale and purchase of goods, without the intervention of middlemen. They may occupy open squares or public buildings, and are generally provided with booths or stalls in which the individual dealers display their wares. The



A Public Market, New York City.

co-operative marketing association originated among the agricultural classes. In the United States it has been extensively used by producers of fruit, vegetables, grains, and dairy products. Terminal markets, which are wholesale in character, are found in practically every European city, and have been introduced into the United States. These markets have arisen as a result of the improvement in transportation and refrigeration facilities, which has made possible the obtaining of products from a large surrounding area, and the extension of the season for goods of a perishable nature. Terminal markets are located at railroad termini, and as near as possible to the water front. Consult

Converse's *Marketing Methods and Policies* (1924) and *Elements of Marketing* (1931); E. Brown's *Marketing* (1925); A. E. Goodwin's *Markets: Public and Private* (1929); R. F. Breyer's *Commodity Marketing* (1931); U. S. Department of Agriculture's *Year Book*.



New City Market, New York City.

Market Value, the exchange power of any commodity in a market, local, national, or international. It is determined by the demand and supply at any given time, and is fixed at a point where these two economic factors will tend to be equalized—where the greatest number of exchanges can be affected.

Markham, Sir Albert Hasting (1841-1918), British admiral. He took part in suppressing the Taiping rebellion in China (1861-2); commanded the *Alert* in the Arctic expedition of 1875, and explored Hudson Bay and Strait.

Markham, Sir Clements Robert (1830-1916), English geographer, served in the Arctic expedition of 1850-1; accompanied the Abyssinian expedition as geographer; and afterward became secretary to the Royal Geographical Society (1863-88), its president (1893-1905), and secretary to the Hakluyt Society (1858-87).

Markham, Edwin (1852-1940), American poet, editor, and lecturer, was born in Oregon City, Ore., of pioneer parents. When five years old he removed with his widowed mother to Central California, where he was variously employed, while still a boy, as farmer and herdsman. He was for ten years headmaster of the Tompkins Observation School at Oakland, Cal., resigning in 1899 to devote his whole time to literary work. In that year he published his famous poem, *The Man with the Hoe*, inspired by Millet's painting, which won the author immediate recognition in both hemispheres. From 1899, Markham made his residence chiefly in West New Brighton, Staten Island, N. Y. He has been a frequent contributor of verse and

prose to the press and periodicals, devoting himself particularly to themes bearing on the brotherhood of man. He was a founder of the Poetry Society of America. He published: *The Man with the Hoe, and Other Poems* (1899); *Lincoln, and Other Poems* (1901); *California the Wonderful* (1914); *New Light on the Old Riddle* (1917); *The Ballad of the Gallows Bird* (1926).



Duke of Marlborough.

Markham, William (c. 1635-1704), American colonial governor, was born in England. In 1681 he was appointed deputy governor of Pennsylvania by William Penn, his first cousin, and came at once to America. Upon reaching Upland (Chester), he appointed a council (Aug. 3, 1681), and later selected the site of Philadelphia. He held successively the posts of secretary of the province, secretary to the proprietary land commissioner (1686), and auditor of accounts (1689). In 1691 he became deputy governor of the Delaware territories. In 1693, after the revocation of Penn's charter, he acted as lieutenant-governor for Governor Fletcher of New York; and after Penn regained control continued to hold that office until 1699, when a proprietary governor arrived.

Markirch, town, dept. of Haut-Rhin, France, famous for its silver, copper, and lead mines in the Middle Ages, which have been reopened recently.

Mark Twain, pen name of **Samuel L. Clemens**.

Marlborough, district, South Island, New Zealand. Sheep grazing is the principal industry; p. 18,317.

Marlborough, John Churchill, First Duke of (1650-1722), British soldier and diplomat, was born in Ashe, Devonshire. In 1678 he married Sarah Jennings, a lady of the bedchamber of the Princess Anne—a

marriage that had a decisive effect on his fortunes. On the accession of James II. (1685) he was raised to the English peerage under the title of Baron Churchill of Sandridge. Promoted to be general, Churchill took an active part in quelling the rebellion of Monmouth; but on the landing of the Prince of Orange he went over to the side of the invader. The latter, on his accession, showed his gratitude by creating him Earl of Marlborough (1688). But he was disliked by William and his Dutch favorites. This and a strong feeling of sympathy with his old master caused Marlborough to enter into plots with King James at Saint-Germain. He was arrested, kept in the Tower (1692), and was for a time in disgrace. But when a rupture with France appeared impending, the King took him to Holland to negotiate for the Grand Alliance. At the accession of Queen Anne, Marlborough was entrusted with the command of the British army in the Netherlands, on the declaration of the War of the Spanish Succession. Anne showered honors on the fortunate Earl and his wife, her closest friend; and the former became regent in all but name. Marlborough stormed successfully the French and Bavarian lines at Donauwörth; and on Aug. 13 gained the glorious but bloody victory of Blenheim. He had Marshall Villars, a worthy adversary, in his front in 1705, and he fell back in retreat. In 1706 he won the Battle of Ramillies, the greatest exhibition of his tactical gifts. Marlborough and Eugene triumphed again in 1708 at Oudenarde and having captured the great fortress of Lille, made preparations for the invasion of France. Villars was defeated in the costly Battle of Malplaquet. Marlborough's army was hampered by politics and lack of supplies, and the campaign of 1710-11 ended in the Treaty of Utrecht. Meanwhile, the Queen, tired of the tyranny exercised by the Duchess of Marlborough, shook off the yoke. A charge was preferred against Marlborough of having embezzled public money, and he was deprived of his offices till the accession of George I., when he was restored to the position in which he stood after the Battle of Blenheim. Marlborough was the first diplomat of his age and the soul of the coalition against France.

Marlinespike, an iron pin, used on shipboard for separating the strands of rope preparatory to splicing or marling; also employed as a lever in tightening rigging, etc.

Marlowe, Christopher (1564-93), noted English poet and dramatist, was born in Can-

terbury. In 1587 he comes into clear light as a dramatist. In the two parts of *Tamburlaine the Great* (1587) he wrote the first great blank verse tragedy. *Tamburlaine* was followed by *The Tragical History of Dr. Faustus* (c. 1588) and *The Jew of Malta* after 1588. In *Edward II*, he essayed historical tragedy, and in *The Massacre at Paris* contemporary tragedy. His only other surviving play, *Dido, Queen of Carthage*, was finished by Thomas Nash. His paraphrase of the *Hero and Leander* of Musæus was completed by George Chapman. In 1593 he was summoned before the Privy Council to answer a charge of heresy arising from some papers of his found among those of Thomas Kyd. Before his case could be fully considered, Marlowe was dead—slain in a drunken brawl at Deptford. Marlowe's best plays are included in the Mermaid Series, ably edited by Havelock Ellis. His complete *Works* have been edited by Brooke (1910).

Marlowe, Julia (1870), stage name of Sarah Frances Frost, American actress, who was born in Caldbeck, Cumberland, England, and came to the United States in 1875. She studied for the stage in New York City. Her metropolitan *début* was made there in 1887 as Parthenia in *Ingomar*. After 1904 she was associated almost continuously with E. H. Sothern, particularly in Shakespearean drama. In 1909 she appeared in *Antony and Cleopatra*, at the opening of the New Theater, New York City; and from 1910 to 1914 she toured the United States in Shakespearean repertory. She was married in 1894 to Robert Taber, from whom she was later divorced, and in 1911 to E. H. Sothern. In 1924 she announced her retirement from the stage.

Marls, a term denoting, in the strictest sense, certain soft, friable clays containing an admixture of calcium carbonate in varying amounts, but loosely applied to various other deposits, in which there is little or no lime present such as the Greensand Marl of New Jersey. In the United States, extensive marl deposits are found along the Atlantic coastal plain. Fresh-water marls are especially abundant in Michigan and Indiana. Marls have long been used as fertilizers because of their effectiveness in promoting nitrification and correcting acidity of the soil.

Marmaduke, John Sappington (1833-87), American soldier, was born near Arrow Rock, Mo., and was graduated from the U. S. Military Academy in 1857. He joined the Confederate army, and fought with gallantry. After the war he founded the St. Louis Eve-

ning Journal and became in 1884 governor of Missouri.

Marmalade, a kind of jam, usually made from oranges or lemons, though the term is sometimes extended to that made from quinces, crab apples, and other fruits.

Marmont, Auguste Frédéric Louis Viesse de, Duc de Ragusa (1774-1852), French marshal. Napoleon made him general of division for his management of the guns in the Battle of Marengo (1800). In 1809, after the Battle of Wagram, he defeated the fleeing Austrians at Znaim, and was in consequence made a field marshal. He maintained the unequal contest till further resistance was hopeless, when he concluded a truce with Barclay de Tolly, which compelled Napoleon to abdicate, and earned for himself from the Bonapartists the title of traitor. He lived in retirement till the Revolution of 1830, when, at the head of a body of troops, he endeavored to reduced Paris to submission. He wrote valuable *Mémoires*.

Marmora, Sea of, (ancient *Propontis*), separates Asia Minor and Europe, and communicates with the Black Sea by the Bosphorus, and with the Ægean Sea by the Dardanelles.

Marmosets, a group of monkeys confined to Central and South America, constituting the family Hapalidæ. They are the lowest in scale of all the monkeys, being, in fact, next to the lemurs. They are small, daintily formed



Silky Marmoset.

animals, usually with hairless faces, large bright eyes, and abundant silky hair. Though prized as pets, they are extremely delicate, and seldom survive the winter when taken to North America or Europe.

Marmots (*Arctomys*) are rodents found in the northern parts of both hemispheres. There are three kinds of marmots in North America, all popularly termed 'woodchucks.'

Marne, department, France, part of old province of Champagne, is traversed by the

River Marne, and to a less extent by the Seine and the Aisne. The center is gently rolling country; the rest flat and monotonous. The climate is dry and sunny, and well suited to the cultivation of cereals and wine, chiefly champagne, in which latter the wealth of the department largely consists. There are woollen industries, tanneries, iron and copper foundries, breweries, and potteries; p.434,-



Alpine Marmots.

ooo. In the early days of the Great War that broke out in 1914, the department was overrun by the Germans.

Marne, river, France, the principal tributary of the Seine, rises on the Plateau of Langres, to join the Seine at Charenton, 2 m. s.e. of Paris. The rapid invasion of France by the Germans in 1914 was checked at this river. See MARNE, BATTLES OF.

Marne, Battles of, First Battle.—By the first days of September, 1914, in the Great War of Europe, the German armies had invaded France through Belgium with the opposing Anglo-French retarding their advance as much as possible until General Joffre would be justified in assuming the offensive. His selected position lay in a general way behind the River Marne. General von Kluck, commanding the right wing of the invaders was marching directly toward Paris; but he suddenly swerved. It was more immediately important to annihilate the French and British than to capture the capital. It was this formidable front that General Joffre was determined to attack in the hope of driving it from French soil. During the day of Sept. 6 he was reinforced by large additions from Paris, rushed to the scene in all available taxicabs and motorbuses of the capital. He had also the British army—three corps and a cavalry brigade—the French cavalry under General Conneau, and on their right the Fifth French Army, now commanded by General Franchet d'Esperey. Next was a second army of reserves—the Ninth—organ-

ized after Aug. 20, and led by General Foch.

It was one of the most critical moments in the history of France. If the Germans should crush and break through the Allies' human barrier, it was a foregone conclusion that the country's capital would soon be taken. Von Kluck, on perceiving an unexpectedly great force threatening his flank, checked his advance across the Marne. This must be noted as one of the events that decided the battle. Meanwhile the British advanced. The remainder of the Allies met with less success. Sept. 7 was a day of desperate fighting. The British renewed their advance at dawn, and by 5 A.M. their center was in possession of Coulommiers. By this capture, the entire right flank of Von Kluck's forward movement was uncovered, and so deadly was the artillery fire that he could no longer remain on the Grand Morin. He therefore retreated behind it, and this gave D'Esperey a chance to move forward. On the morning of Sept. 8 the Allies were cheered and encouraged by the evidence that the whole German right was in retreat. But, through his air scouts, Foch now made a much more important discovery. For some reason not yet explained, but probably owing to the shifting of troops to Russia, a gap had been formed between Von Bülow's left and Von Hausen's right. Foch made a daring move. He pushed his right wing forward, and drove a wedge between the two German armies.

By the evening of Sept. 10 the battle was practically over, and had assumed, on the part of the Allies, the character of a drive. The British were well across the Marne. Foch entered Châlons, and followed Von Bülow to the neighborhood of Rheims. By the 12th the Germans had reached their previously prepared defense position along the line of the Aisne. The chief result of this memorable week was that it eliminated the factor of the speedy crushing of France from the Teutons' plans, which had been counted on in their calculations.

Second Battle of the Marne.—The fury of the Third Battle of the Aisne drew to a close on June 18, 1918. Foch, besides repelling from day to day Ludendorff's hordes and conserving and nursing his own mass of maneuver, was working intensely on the problem of an answer to the new German tactics. For these tactics he had a weapon of supreme value in his new light tanks, which, modelled on the British 'whippet,' were now appearing in large quantities on the French front. In addition, Foch for the first time had num-

bers at his command, since over 600,000 American troops had arrived by this time. It is hard to tell how far Germany was aware of the full danger awaiting her in this addition to the Allied strength. Ludendorff was an experienced soldier, and he considered that he still had a chance of winning the victory which he had promised the German people. He had collected every reserve from every point on which there were German troops. He had brought a new army, the Ninth under Von Eben, from the East, to act as an 'army of pursuit' when the Allied front was broken. His plan was to strike out and to press beyond the Marne and cut the great lateral railway from Paris to Nancy. At the same time Von Mudra (who had succeeded Fritz von Bülow) with the First Army, and Von Einem with the Third Army, were to strike east of Rheims, between Prunay and the Argonne. If these operations succeeded, the French front would be divided. Then sweeping westward with the help of Von Eben Von Boehn would march on Paris down the valley of the Marne. The Germans christened the coming battle the *Friedensturm*, the action that would bring about a 'German peace.'

The enemy was so confident that he made little secret of his plans. From deserters and prisoners Foch gathered the main details long before the assault was launched. He resolved to meet the shock as best he could, and at the right moment to use every atom of reserve strength to strike at the enemy's nerve center. It was a bold decision, for if he failed it would be hard to save Paris. Some retirement was inevitable, but it must be calculated and defined. The critical area was east of Rheims. At midnight on Sunday, July 14, 1918, Ludendorff began a violent artillery 'preparation' that lasted until 4 o'clock in the morning. About 4 A.M., just at dawn, the German infantry crossed the parapets. The Germans passed the Marne at various points. It was a substantial advance; but one thing it had utterly failed to achieve. East of Rheims Von Mudra and Von Einem made no headway at all. Gouraud's counter-bombardment dislocated the German attack before it began. Not a French gun was lost, and Gouraud's battle zone was untouched. Von Mudra and Von Einem were utterly exhausted. Yet on July 17 Ludendorff still persisted. All day the battle swung backwards and forwards without material results. But by evening the eight German divisions were very weary.

The time had now come for Foch's counter-stroke. He resolved to thrust with all his available reserves against the weak enemy flank between Soissons and Château-Thierry. The great road from Soissons by Fère-en-Tardenois to Rheims, with its branches running south to the Marne, was the main feeder of the whole German line in the salient. If that were cut anywhere north of Rozoy supply would be gravely hampered. Moreover, all the railway communications between the salient and the north depended upon the junction of Soissons. At the moment between Soissons and Château-Thierry, Von Boehn had only eight divisions in line and six in support; but he had large reserves inside the salient; and the new Ninth Army, under Von Eben, was forming in the rear for its advance on Paris.

When Foch decided to stake everything on this attack, more than one French commander viewed the hazard with grave perturbation. There were anxious consultations between Foch, Pétain, and Fayolle, who commanded the group of armies. But the most intimately concerned had no doubts.

On July 18 at 4:30 A.M. out from the shelter of the woods came a great fleet of French 'mosquito' tanks. Before the puzzled enemy could realize his danger the French and Americans were through his first defences. The advance of July 18 was like a great bound forward. The chief work was done by Mangin's left wing, which was swept through the villages of Pernant and Mercin, and by half-past 10 in the morning held the crown of the Montagne de Paris, half a league from the streets of Soissons and within 2 m. of the vital railway junction. His American troops took Courchamps, Torcy, and Belleau. Sixteen thousand prisoners fell to the French, and some fifty guns; and at one point Mangin advanced 8 m.—the longest advance as yet made in one day by the Allies in the West. Foch had narrowed the German salient, crumpled its western flank, and destroyed its communications. He had wrested the initiative from the enemy and brought the *Friedensturm* to a dismal close.

For 36 hours Von Boehn hesitated; then on the afternoon of Friday he gave orders for the retreat. Mangin, according to Foch's orders, held his hand. He had done all he had set out to do, and had cut the Soissons road. On Sunday, July 21, the Sixth and Fifth Armies struck. Dégoutte's object was to out-flank Von Boehn on the north bank of the Marne and drive him from the river. His

French and American troops swept eastward, while De Mitry, who had also American divisions in his command, forced the river passage between Gland and Chartèves. Château-Thierry was no longer tenable, and that evening the Sixteenth Army was in its streets. The Allies were now close to the vital road junction of Oulchy-le-Château. Here Von Boehn attempted a stand. Ludendorff still hoped to make the main Château-Thierry-Epernay-Châlons railway unusable by the Allies. For this error of judgment Germany paid high in men and guns. By the evening of July 23 the Soissons-Château-Thierry road, save for the small section on the plateau s. of Soissons, was wholly in Allied hands. The next day Oulchy-le-Château fell. Late the following evening Von Boehn began a comprehensive retirement between the Ourcq and the Ardre. But the Americans between Seringes and Meunière Wood found every yard disputed. Von Boehn had found a line which he believed he could hold, Hill 205 on the crest of the heights, the key of the whole countryside. Mangin struck at dawn on Aug. 1, with his whole army, but especially with his right wing; and by 9 in the morning he had the crest of Hill 205. On Aug. 2 the whole Allied line swept forward.

During the first days of August the whole countryside between the Ourcq and Aisne was murky with the smoke of burning villages, while the four armies of France pressed in the contracting arc of the German front. Ludendorff now had no more than 26 reserve divisions at his disposal. Every division was under strength. Indeed, so bad was the case that Ludendorff was compelled to appeal to Austria and now for the first time an Austrian division was identified on the front in France. Ludendorff's one aim was to find security for the coming winter; and to build up as soon as possible a new reserve. Foch, now made Marshal of France, had no mind to waste a single hour in operations which were not vital. When the Allies had breasted the Montagne de Paris on that morning of July 18, they had, without knowing it, won the Second Battle of the Marne, and with it, the war. See EUROPE, GREAT WAR OF.

Maronites, a body of Christians, numbering about 250,000 who are scattered throughout Syria, particularly in the Lebanon region, and in Egypt, and Cyprus; they have congregations in New York, Boston, Philadelphia, St. Louis, Scranton and other American cities. They derive their name from a supposed early monk, Maron, whom they revere as a saint.

They have suffered severely at the hands of the Druses, and in 1860 the savagery of both sides reached such a pitch as to necessitate the intervention of the great powers. See DRUSES.

Maroons, a term applied to runaway negro slaves who took refuge in the inaccessible parts of the West Indies and in Dutch Guiana, where they sometimes became strong enough to form independent republics, which long held out against the constituted authorities.

Maros-Vasarhely, town, Roumania. It has a noted library, a citadel, and a fine Gothic church (1446). Sugar, spirits, pottery and tobacco are manufactured; p. 30,000.

Marot, Clément (1496-1544), French poet, distinguished for graceful satire, a singularly light touch, and natural expression. The distinctive *style Marotique*, as it is called, has exerted no little influence on French literary language.

Marozia, (d. 938), a Roman woman notorious for her infamous life, daughter of the Empress Theodora and of Theophylact, 'consul and senator of the Romans.' As mother or grandmother of three popes she exercised entire control of Rome for some years. She styled herself 'senatrix of all the Romans' and 'Patricia.' Her ultimate fate is unknown.

Marprelate Controversy, a pamphlet warfare carried on (1589-90) by certain Elizabethan Puritans against the established church and episcopacy. They were personal and scurrilous, but for this very reason were highly popular.

Marquand, Henry Gordon (1819-1902), American capitalist, was born in N. Y. City. He was a founder, trustee, treasurer, and from 1890 until his death president, of the Metropolitan Museum of Art in N. Y. City.

Marquand, John P. (1893-), American author, was born at Wilmington, Del. Among his brilliant books are *The Late George Apley* (1937), awarded the Pulitzer Prize; *Wickford Point* (1939); *H. M. Pulham, Esquire* (1941); and *So, Little Time* (1943).

Marquesas, or Mendana Islands, group of islands in the Pacific, annexed to France (1842), and included in the Tahiti administration; total area, 480 sq. m. The islands are mountainous and of volcanic origin.

Marquetry, the art of wood mosaic, veneering or inlaying common white wood with thin pieces of rare and costly woods or other material. The art was known in Egypt and the East two thousand years ago. Varieties are *mosresco* (black and white), *certosina* (cypress or walnut inlaid with ivory), *boule* (tor-

toise-shell ground with design in metal), *counter* (metal ground with tortoise-shell inlay), and *Chippendale* furniture. Consult Jackson's *Intarsia and Marquetry*.

Marquette, city, Michigan, situated on Iron Bay, is a shipping point for the output of iron mines. Presque Isle Park is a feature of scenic interest. The chief industries are iron-smelting and the manufacture of mining machinery, gas engines, powder, and lumber; p. 15,928.

Marquette, Jacques (1637-75), French Jesuit missionary. He was ordered to New France (Canada) as missionary to the Indians in 1666, and arrived in Quebec on September 20th. His final mastery of no less than six difficult Indian dialects was considered by his colleagues a remarkable achievement; he also became an adept in aboriginal characteristics and customs. Marquette set up a new mission on Point St. Ignace, near Mackinac Island. Joliet arrived here on Dec. 8, 1672, bearing orders to Marquette from the Jesuit authorities to accompany the civil explorer on his trip to discover the Mississippi, and do what he might to Christianize the wild tribes.

The expedition (consisting of Joliet, Marquette, and five other Frenchmen as assistants) started from St. Ignace in two birch-bark canoes, May 17, 1673. After descending the Mississippi to the mouth of the Arkansas, they desisted from further prosecution of their search, owing to reports of Spaniards below.

The following spring Joliet left for home, but his canoe capsized in Lachine Rapids (above Montreal) and he lost his maps, diary, and other papers prepared during the winter. Marquette's simple narrative was dispatched to his superior at Quebec, constituting almost our entire stock of information concerning the expedition. His holograph map of the route is now at St. Mary's College, Montreal. Owing to illness, it was autumn before Marquette could start for the valley of the Illinois, to establish the mission he had promised the Indians of that region. Although successful in his mission, illness soon compelled him to attempt the return to St. Ignace. While encamped on the site of Ludington, Michigan, he died on May 18, 1675. The original ms. journal of this second expedition, continued through April 6, is at St. Mary's College, Montreal. He was an accomplished linguist, a preacher of undoubted capacity, had acquired unusual powers of mastery over the minds of savages, and bore a saintly character.

Marquette University, a Roman Catholic coeducational institution at Milwaukee, Wis.,

founded in 1881. It comprises departments of arts and science, applied science and engineering, dentistry, law, journalism, music, school of nursing, business administration, and speech.

Marquis, or **Marquess**, the second order in the peerage of England, ranking below a duke and above an earl. The eldest son of a marquis is generally by courtesy an earl, and the younger sons and the daughters are styled lords and ladies. His wife is a marchioness. Marquis is often the courtesy title of the eldest son of a duke during his father's lifetime.

Marquis, Don (1878-1937), American journalist and humorist, born in Illinois, was associated with Joel Chandler Harris in newspaper work in Atlanta, Ga., but later removed to New York City, where he successively conducted columns in the *New York Sun* and the *New York Tribune*, winning great popular favor as a wit and philosopher. His published works include *Hermione* (1916), *Prefaces* (1919), *The Old Soak* (1921), *Noah an' Jonah an' Cap'n John Smith*, poems (1921), *The Old Soak's History of the World* (1924), *Archy and Mehitabel* (1927), *Love Sonnets of a Cave Man* (1928).

Marriage, in general terms, the union of a man and woman, intended to be permanent and sanctioned by society. Among animals such a union, which, properly speaking is mating, not marriage, is rooted in instinct. Among the lower human races marriage is founded on the slow growth of customs and traditions; among the higher human races it becomes an institution in which the sanction of legal enactments is superimposed on that of custom and tradition. The care of offspring is an essential element in the constitution of marriage.

It has been argued that the marriage of earliest man must have corresponded to the monogamy and polygamy prevailing among modern anthropoid apes. We may not state confidently that the earliest form of human marriage was either a more or less regulated promiscuity or an individual marriage resembling that of the higher apes. The most primitive form of marriage system of which any trace can now be detected—though even here the evidence is far from complete or altogether satisfactory—is that known as group marriage, which has been carefully investigated in Australia. In group marriage all the women of one class are regarded as the actual, or at all events the potential, wives of all the men of another class. Polyandry, occurring especially in Tibet, by which usu-

ally all the brothers in a family are the husbands of one wife, may be regarded as a restricted kind of group marriage on a small scale.

Among many primitive peoples descent is reckoned not in the paternal but in the maternal line. Bachofen, who first showed the wide prevalence of this custom, founded on it his theory of the matriarchate. His theory can no longer be maintained in its original form. We do not know that female descent has been universal; it is by no means necessarily associated with ignorance of paternal descent, nor is the supremacy of women involved, although female descent seems favorable to the high social standing of women.

On the whole, it may be said that individual marriage, more or less permanent and usually monogamous, has been the prevailing human type. Considerable importance was formerly attached to the distinction between endogamy (marriage within the tribe) and exogamy (marriage outside the tribe), but, as a rule, marriage is at the same time both endogamous in its avoidance of racially remote groups, and exogamous in its avoidance of union within the family, although it may tend to sway more in one direction than the other—usually in the direction of exogamy. This is favorable to marriage by capture, which has been a method of obtaining wives among uncivilized and among warring peoples. However, 'marriage by capture' should be regarded usually as a recognized and accepted form of courtship.

It is commonly held that with the growth of social order marriage by capture slowly gives way to marriage by purchase. It must be remembered that, among primitive peoples 'purchase' has not so narrowly commercial a significance as it has with us; that the price given on receiving the bride has a compensatory and often ritual significance, and is not necessarily a mere barter which degrades the position of the wife. Polygamy, frequently associated with a developed marriage-by-purchase system, is found only among the richer individuals, even in the social groups in which it occurs, and it dies out as civilization progresses still further. The marriage system in Europe during historical times has been a monogamy in which the patriarchal authority has shown a constant tendency to decrease.

The modern tendency is to regard marriage as primarily a civil contract, entered upon with the free consent of the contracting parties. In some parts of the United States

a simple agreement, even without witnesses, has been held to constitute a valid marriage, provided that the parties thereto were not incapacitated for marriage under the law. These marriages, which are known as common-law marriages, were abolished in New York in 1901, but under the present law a written contract, signed before witnesses, and recorded within six months in the office of the clerk of the town or county in which it is made, is a valid marriage.

Owing to the social significance of the marriage contract, however, almost all modern governments require a considerable degree of publicity respecting it. In the United States great diversity of practice exists. In most States a license or certificate must be secured from some competent public authority; the marriage must be solemnized by a minister of religion, clothed by law with the power of solemnizing marriages, or by a magistrate or other public official. Further State control in the marriage contract appears in the provisions relating to prohibited, void, and voidable marriages.

Marriage is always forbidden within certain degrees of consanguinity. In many of the States, marriage of whites with negroes or mulattoes is prohibited. In some States, unions of whites with Indians or Chinese are also prohibited or void. Social reformers have, in recent years, persistently urged the restriction of marriages of those unfit for the rearing of socially desirable offspring, as paupers, criminals, and the insane, and some states have adopted laws prohibiting the marriage of couples either one of whom is feeble-minded or epileptic; paupers; and of persons afflicted with certain venereal diseases. Laws for the prevention of socially undesirable marriages have not, however, been systematically enforced. The ever increasing complexity of modern life and the changed economic status of women in the last quarter century, have caused a chaotic condition regarding the institution of marriage. One modern aspect of marriage is that known as 'companionate marriage,' advocated by Judge Ben B. Lindsey of Denver. 'Companionate marriage is a programme which proposes to legalize, stabilize and direct certain of the customs, privileges and practices of modern marriage. The first of these is birth control. The second is divorce by mutual consent for persons who, having no dependent children, cannot remain married by mutual consent. The third concerns alimony, which would not be the arbitrary right of the wife, as at

present. The fourth would be for the State to undertake the education of youth and married couples in the laws of love, sex, and life, and to equip them for the duties of marriage and parenthood.'

By the common law a union between a man and woman to be valid must be voluntary, both parties must be unmarried at the time and the union must be entered into for their joint lives. Marriages prohibited by law on grounds of public policy or in the interests of the parties thereto may nevertheless be valid and binding unless set aside by judicial decree. As from the point of view of the state the object of marriage is procreation, impotence on the part of either the husband or the wife is still a ground for the dissolution of the marriage tie. It is an almost universal rule that a marriage contracted according to the form recognized in the country or state where it takes place will be recognized as sufficient elsewhere. If a divorced person who has been forbidden by the courts of New York to marry again marries in another State or country, the marriage will be perfectly valid in New York.

In the Roman Catholic church marriage is considered as a sacrament and as such is indissoluble for any cause. It may be annulled or set aside for a number of reasons, such as consanguinity, a previous marriage, impotency, and other reasons. In most Protestant churches marriage is regarded rather as a civil contract than as a sacrament, and divorce and remarriage are allowable for certain reasons. Marriages contracted between Roman Catholics and Protestants are known as 'mixed marriages.' They are legal but are not looked on with favor by the Roman Catholic church and are generally discouraged. In order to consummate a mixed marriage the Roman Catholic party must receive a grant of dispensation from the Pope, must promise to bring up all children of the union in the Roman Catholic faith and must waive an Evangelical marriage ceremony. The marriage of a Roman Catholic person with a divorced person is held by the Roman Catholic church to be unlawful. See also **DIVORCE**; **HUSBAND AND WIFE**. Consult Westermarck's *History of Human Marriage*; Tylor's *Primitive Culture*; Howard's *History of Matrimonial Institutions*; Keyserling's *Book of Marriage* (1925).

Marrow, the soft tissue which fills the hollow shafts of the long bones. It is very vascular, made up of areolar tissue (loose delicate network, with numerous interstices),

fat and marrow cells, and many blood-vessels. Its function is apparently to produce red blood corpuscles; the belief is also current that there is an interrelationship between the bone-marrow and spleen, the latter also being a blood-forming organ. For that reason red marrow has of late years been given in anæmia, particularly in pernicious anæmia, with temporary success.

Marrow Controversy, a discussion in the Church of Scotland (1718-27) over the orthodoxy of a work, *The Marrow of Modern Divinity*, published in 1646 by Edward Fisher, an English Puritan.

Marryat, Florence—Mrs. Francis Lean—(1838-99), English author, actress, and journalist. She began writing when very young, but her first work to attract attention was *Love's Conflict* published in 1865. This was followed by 75 other novels, four of the latest dealing with spiritualism, in which she firmly believed. Her works have been successfully dramatized in several cases. *My Own Child* is probably her most popular, and *There is no Death* her most remarkable book, it being 'a transcript of her own experience' in spiritualism.

Marryat, Frederick (1792-1848), English sailor and novelist. He served in the War of 1812, and the war in Burma. Settling at Hammersmith (1830), he engaged in literary work and was editor of the *Metropolitan Magazine* (1832-5). His chief novels are *Frank Mildmay* (1829), *The King's Own* (1830) which won high praise from Washington Irving,



Telescopic View of Mars.
Showing the canal Lethes extending northwards from the Syrtis Minor.

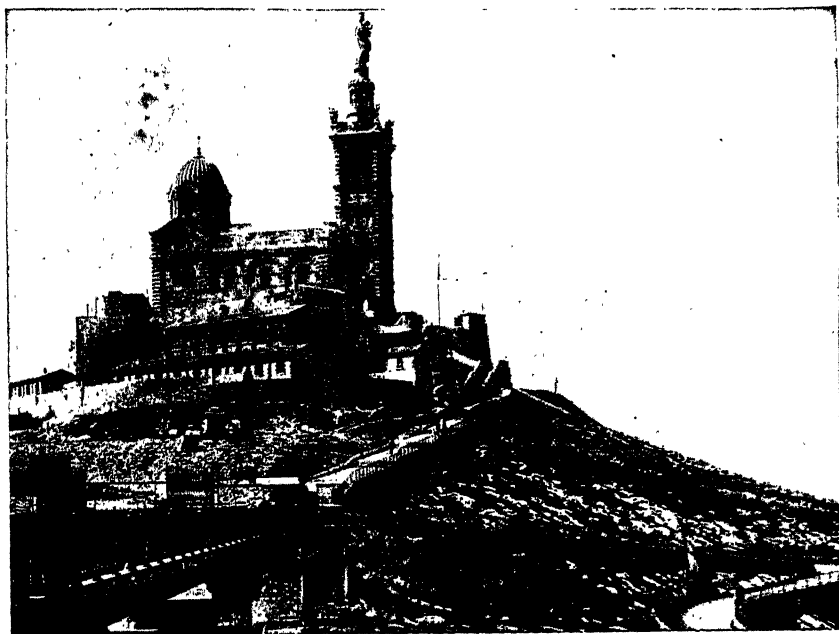
Midshipman Easy (1834), *Jacob Faithful* (1834), and *Children of the New Forest* (1847).

Mars, one of the larger planets, the fourth

from the sun, around which it travels in a period of 687 days, at a mean distance of $141\frac{1}{2}$ million miles. At favorable oppositions, when within $35\frac{1}{2}$ million miles of the earth, Mars shines as a red star of more than twice the brightness of Sirius. The globe of Mars has a mean diameter of 4,230 m., and rotates in a period of 24 hours 37 minutes 23 seconds on an axis inclined $24^{\circ} 50'$ to the orbital plane. Seasonal variations are hence strongly accentuated, and their effects are

who was identified with the Greek Ares. He was the reputed father of Romulus, and so of the Roman nation. As the protector of agriculture he was called Silvanus; as the protector of the citizens, he was Quirinus; and as the war-god proper, Gradivus.

Marsala, fortified town, Sicily, noted for its wines. It has a cathedral, a castle and several fine churches. It occupies the site of the ancient Lilybæum; p. 60,000. It was taken by American forces in July, 1943.



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Marseilles: Church of Notre Dame.

visible in the melting and re-formation of polar snowcaps. The atmosphere is thin, and usually transparent. The general surface is reddish, but three-eighths of it is covered by blue-green tracts, in the main permanent, though subject to minor variations. They were long regarded as seas, but are now thought by many to represent areas of vegetation.

An intricate network of fine straight 'canals' was first detected by Schiaparelli in 1877. Opinions of astronomers regarding the appearance of the canals and even their objective reality differ widely. Consult Jones' *General Astronomy* (1922).

Mars, in Roman mythology the god of war,

Marsala, a light-colored Sicilian wine of the sherry type, but more delicate in flavor and somewhat sweeter. Its alcoholic content varies between 20 and 25 per cent.

Marseillaise, the French national hymn, composed by Claude Joseph Rouget de Lisle, a young engineer officer. Because of its being sung by the volunteers of Marseilles when they entered Paris, and later at the storming of the Tuileries, it was designated by the Parisians the *Hymne des Marseillais*, and later *La Marseillaise*.

Marseilles, chief port and second city, France, stands 27 m. e. of the Rhône mouth, round a landlocked natural basin (the Old Port). It has been a place of commercial im-

portance from very early times, and now shares with Genoa the commercial supremacy of the Mediterranean. The town is girt in by hills covered with vineyards and olivegroves, and dotted with white country houses. The Cannabière, the main street of the city, is a source of pride to the inhabitants, while the other principal street, the Rue de Rome, is prolonged as the Prado, a magnificent boulevard lined by two rows of trees. The new harbor, a series of basins, comprises almost 420 acres of water and some 12 m. of quays, and is capable of accommodating vessels of all sizes. Off the port lies the Château d'If, associated with Dumas' *Count of Monte Cristo*. The chief exports include brandy, grain and flour, semolina and macaroni, oils (vegetable and mineral), oil-cake, soap, refined sugar, and wine. Marseilles' manufacturing specialties are oil-refining and soap-making. The fishing industry, especially for tunny, is flourishing. During the Great War Marseilles was an important communication base; p. 914,000.

Marsh, Othniel Charles (1831-99), American naturalist, was born in Lockport, N.Y. In the Rocky Mountains, he obtained fossils of more than 1,000 new species of vertebrates. One of his most valuable scientific achievements was the tracing of the phylogeny of the horse. He published many palæontological monographs, the best being: *Ocotornithes* (1880), *Dinocerata* (1884), and *Dinosaurs of North America* (1895).

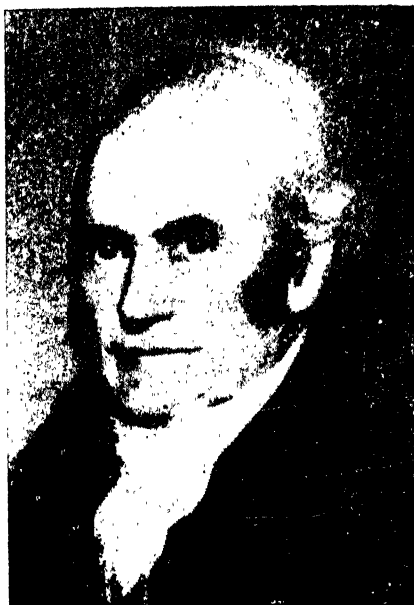
Marsh, Sylvester (1803-84), American merchant and inventor. Removing to New Hampshire in 1864, he obtained a charter for building the inclined railroad up Mt. Washington, the cog-wheel, engine, and brakes employed being of his own invention.

Marshall, originally a groom or manager of horses. In France the term always indicated a military office. It was abolished after the Second Empire, but revived in December 1916, when General Joffre was created a marshal of France. In England the office is hereditary and is a court rather than a military dignity. In the United States the marshal is a ministerial officer of the courts, appointed by the President (one for each judicial district), and charged with the execution of the mandates of the courts.

Marshall, George C. (1880), general, chief of staff of the U. S. Army since Sept. 1, 1939. He was chief of operations for the First Army in France in World War I, and was Gen. Pershing's aide for 5 years afterward.

Marshall, Henry Rutgers (1852-1927), American architect and psychologist, was born in New York City. He was a leader in the movement for proper control of municipal art in the United States. His principal reputation was gained, however, by his work as a psychologist, particularly in the department of aesthetics. Among his publications are *Pain, Pleasure, and Aesthetics* (1894); *War and the Ideal of Peace* (1915); *Mind and Conduct* (1919); *The Beautiful* (1921).

Marshall, John (1755-1835), eminent American jurist, was born in Fauquier co., Va. At the age of eighteen he began to study law, but left to serve in the Virginia militia. At the expiration of his command Marshall spent



John Marshall.

(From the painting in the Capitol at Washington.)

a few months at William and Mary College; was admitted to the bar in Virginia in 1780; and in 1783 removed to Richmond. Marshall's first appearance in national politics was in 1788, as a member of the State convention called to act upon the ratification of the Constitution of the United States. His early association in the North with men from so many different States, risking all for a common cause, had made him in principle a nationalist. In this spirit, soon after Patrick Henry had stated to the convention, with

great force, his objections to the ratification of the Constitution, Marshall assumed the formidable task of a reply, and without matching Henry's eloquence, succeeded by solid reasoning in meeting fully the weight of his attack.

In the controversy as to the ratification of the Jay Treaty, Marshall took what was in Virginia the unpopular side and succeeded in changing public opinion. In 1795 he declined a tender by Washington of the office of attorney-general, and the next year that of minister to France. In 1797 Marshall accepted an appointment as one of the three special envoys to France, sent to negotiate with the Directory as a last hope of preventing war. His services in the negotiations with Talleyrand, as the minister of foreign affairs, were conspicuous, and he returned to the United States with a high national reputation. After declining an offer from Adams of an appointment as an associate justice of the Supreme Court of the United States, he accepted a nomination (1798) to the lower house of Congress, where he soon became the acknowledged leader on points of international and constitutional law. He resigned his seat early in 1800 to become Secretary of State.

On January 31, 1801, Marshall was appointed Chief Justice of the United States. Marshall's term ended only with his death, in 1835. For over thirty years he dominated the court and shaped its course. For the first ten years, the opinions in almost all cases decided were written and delivered by him alone. As Professor Thayer has observed, this 'seemed, all of a sudden, to give to the judicial department a unity like that of the executive.' For Marshall's judicial opinion consult *John Marshall, Complete Constitutional Decisions*, edited by Dillon; Beveridge's *Life of John Marshall* (4 vols. 1916-19).

Marshall, Thomas Riley (1854-1925), wartime vice-president of the United States, born in Indiana where he was admitted to the bar. Four years Governor of the State (1908-1912) he was nominated on the Democratic national ticket with Woodrow Wilson in 1912 and again in 1916. His distaste for the professional profundity of politicians is best illustrated by his famous rejoinder to a request for a statement on the nation's ills, that the country's gravest lack was a good five-cent cigar.

Marshall, William Louis (1846-1922),

American military engineer, was born in Washington, Ky. In 1900-08 he was engineer in charge of fortifications and improvements in New York harbor. He became chief of the U. S. Engineer Corps in 1908; and in 1910 became consulting engineer to the Secretary of the Interior.

Marshalling, the equitable apportionment of funds or securities among two or more creditors in such a way as to prevent one from so enforcing his claim as to exhaust a fund or security upon which another is dependent for the satisfaction of his demand.

Marshall Island, in the Pacific Ocean, between lat. 5° and 15° N. and long. 165° and 173° E. The inhabitants are Micronesians, and are skilful navigators. The Marshall Islands were acquired by Germany in 1885. Since the Great War they have been administered by Japan as mandatory; p. 15,000, of whom only a few are Europeans.

Marshalsea, a famous old prison in Southwark, London, abolished in 1849.

Marsh Gas. See **Methane**.

Marsh Hawk, an American hawk, commonly seen all over temperate North America, flying low and indolently over marshy grounds, where it finds its prey in mice, frogs, and the like. The plumage of the male is bluish gray, with a cross-barred tail; that of the female is dusky; and both sexes are easily recognized by their white rumps.

Marsh Mallow, a plant native to Europe, but naturalized in America, where it grows on marshy land near the sea. It is a hairy or downy plant, and in autumn bears panicles of flowers of a pale bluish color. The mucilaginous root is used in a confection, and in medicine as a demulcent and emollient.

Marsh Marigold, a brilliantly flowered marsh plant, with large, shining, kidney-shaped leaves, and flowers like large buttercups. In the United States it is also known as cowslip.

Marsivan, or **Merzifun**, town, Asiatic Turkey, is the principal center of American missionary activity in Asiatic Turkey. It was the scene of Armenian massacres in 1895; p. 20,000.

Marston, John (?1575-1634), English dramatist. His first plays, *The History of Antonio and Mellida* and *Antonio's Revenge*, were acted by the children of St. Paul's in 1601. *The Malcontent* (an advance on these in style) was produced in 1604; *Eastward Ho!* (which Marston wrote with Jonson and Chapman) in 1605; and in the same year,

The Dutch Courtesan, Marston's best work, subsequently revived as *The Revenge*. See his *Collected Works*.

Marsupials, an order of mammals formerly separated from the Eutheria as a sub-class Metatheria or Didelphia. (See MAMMALS.)

parts of the globe the primitive marsupials seem to have gone down before their more highly organized rivals; but in the Australian area many of the marsupials show, in habits and external appearance, a real resemblance to their Eutherian analogues. The marsu-



Species of Martens.

1, American and N.-European pine marten; 2, Sable; 3, Beech marten; 4, Fisher marten; 5, East Indian marten.

Fossil remains show that they were in the early Tertiary period widely distributed over Europe and N. America. Now, with the exception of the American opossums, and a little-known S. American animal, they are confined to the Australian area. In other

pials include the opossum, Tasmanian wolf, bandicoot, wombat, and kangaroo, which represent the highest point of specialization which the marsupials have reached.

Martel, Charles. See **Charles Martel**.

Martello Towers are said to have been

first built by Charles v. in Italy for coast defence; but the name is derived from a tower on Cape Mortello in Capraja, near Corsica. The martello towers on the English coast from Beachy Head to Hythe were built at the end of the 18th century, and mounted one gun.

Marten, a name applied in various combinations to a number of animals of the weasel family. From the true weasels, stoats, polecats and their allies, the martens differ in their larger size, somewhat longer legs, in the absence of a strong smell, and in the presence of a small first premolar in both jaws. In habit, the martens are arboreal, spending most of their time in trees, in hollows of which the nest is built. Like their allies, they are actively carnivorous and bloodthirsty, preying chiefly upon small birds and mammals. Like their allies also, they are readily tamed if taken young, and have been kept as domestic pets both by ancient and modern peoples. The American marten, called 'sable' in Canada, differs little from the European pine marten (*Mustela martes*), and is one of the most valuable of our fur-bearing animals, but is now scarce in civilized regions. It reaches a length of about eighteen inches, exclusive of the tail.

Martens, Frederick de (1845-1909), Russian authority on international law, was born in Pernaú, Livonia. He was Russian representative and president of the second commission at The Hague Peace Conference in 1899, and second Russian delegate in 1909; and was a member of the permanent international court of arbitration.

Martha's Vineyard, island, Dukes co., Massachusetts; 4 m. off the mainland, from which it is separated by Vineyard Sound. It is 23 m. long and 10 m. wide. The n. shore presents precipitous bluffs, culminating in Gay Head, at the western end, 200 ft. high. It is noted as a summer resort. Edgartown and Tisbury are the chief towns. There is a small Indian reservation at Gay Head. The island was discovered and named in 1602 by Bartholomew Gosnold; p. 5,533. Consult Banks' *History of Martha's Vineyard* (3 vols. 1911).

Martial, Marcus Valerius Martialis (43 to c. 104 A.D.), Roman epigrammatist, was born at Bilbilis in Spain, and came to Rome probably about 63 A.D. His epigrams are short poems, in a variety of metres, on an infinite variety of subjects, but all alike in making some definite witty point. In fact,

Martial was the inventor of the epigram in the modern sense of the word.

Martial Law, a euphemism for military government. There is no settled body of rules in any state known as martial law, nor does the phrase have reference to the laws of war as defined in international law. It is merely a convenient expression for the suspension of the ordinary procedure of the courts, and the usual guarantees of personal liberty and security, and the substitution therefor of the arbitrary methods of the military arm of the government. Both the Federal and State governments may proclaim martial law, when necessary. The former is restricted to occasions on which the national peace or welfare is threatened by an invading enemy or by rebellion; the latter have the authority, within State limits, of repressing by military force any disturbance or disorder that menaces the public safety and with which the courts are unable to contend. See HABEAS CORPUS; MILITARY LAW. Consult Birkhimer's *Military Government and Martial Law* (1904).

Martigny, three connected villages, canton Valais, Switzerland; 24 m. s.e. of the Lake of Geneva. It is a tourist center; p. 5,677.

Martin, a name applied to various members of the swallow family, which have the metatarsus and toes feathered, and bear white feathers over the rump; the tail is some-



House Martin.

times forked and sometimes squared. In the United States, the best known form is the large steel-blue purple martin (*Progne subis*), a familiar migratory resident of gardens. The sand martin is a small, dusky species, known nearly all over the world—usually called *bank swallow* in the United States, See SWALLOW.

Martin, the name of five popes.

MARTIN I. (649-655) opposed the Emperor in the Monothelete controversy; and was arrested (653) and banished to Kherson in the Crimea, where he died in 655. See MONOTHELETES.

MARTIN II. or MARINUS I. (882-884).

MARTIN III. or MARINUS II. (942-946).

MARTIN IV. (1281-1285) was born in Montpensier, France. Through the influence of Charles of Anjou he was elected pope in 1281, and was ordained pope at Orvieto. His support of French projects in Sicily and Greece aroused Italian opposition, and alienated the Greek Church, which had been united with the Roman in 1274.

MARTIN V. (OTTO COLONNA) (1417-31) was chosen pope at Constance in 1417, during the session of the council which deposed John XXIII., and set aside the rival claims of Gregory XII. and Benedict XIII., thus ending the forty-year schism. Martin v. recovered and reorganized the Papal States, which had fallen into disorder during the schism; rebuilt the capital; took active steps against heresy, particularly that of the Hussites in Bohemia; and strengthened the papal authority in France and England. Consult Pastor's *History of the Popes* (Vol. 1); Creighton's *History of the Papacy from the Great Schism to the Sack of Rome* (Vol. II., 1902); Mann's *Lives of the Popes* (1902-10).

Martin, Edward Sandford (1856-1939). American author, born in Owasco, N. Y. He was graduated (1877) at Harvard, where he was one of the founders of the *Harvard Lampoon*. He engaged in various occupations, including law and journalism, until 1885, having meanwhile been the first editor of *Life*. After 1896 he lived in New York City, and he was continuously connected with *Life* and *Harper's Weekly*. He gained a special reputation as a writer of essays, paragraphs, and verse, and as writer for twenty years or more of the editorials in *Life*. His books include *A Little Brother of the Rich*, verse (1890); *Poems and Verses* (1902); *The Courtship of a Careful Man* (1905); *In a New Century* (1908); *Reflections of a Beginning Husband* (1913), and *What's Ahead* (1927).

Martin, Gregory (d. 1582), English Biblical translator, was born in Maxfield, Sussex. Unable to conform to Protestantism, he fled to the English college at Douay and was ordained priest. Settling at Rheims (1578), he devoted the remainder of his life to the translation of the Bible known as the Douay Version.

Martin, Homer Dodge (1836-97), American landscape painter, was born in Albany, N. Y. His work was too impressionistic and tinged with melancholy to find popular favor at once; and it was only after his death that he took high rank among American land-

scape painters. His paintings include landscapes along the Seine, at Honfleur on the French coast, and along the Hudson River. His *View on the Seine* and *Sand Dunes, Lake Ontario*, are in the Metropolitan Museum of Art.

Martin, Luther (1744-1826), American lawyer, was born in New Brunswick, N. J. He opposed the ratification of the Constitution, and published an account of the convention. In 1804 he defended Samuel Chase, and in 1807 was one of the counsel for Aaron Burr. From 1814 to 1816 he was chief justice of the court of oyer and terminer in Baltimore; and was again attorney-general of Maryland in 1818-20. Consult Goddard's *Luther Martin, the Federal Bulldog*.

Martin, Saint, of Tours (c. 316-c. 400), was born in Sabaria, Pannonia, and served under Constantine and Julian. After leaving the army he entered the church and, being persecuted by the Arians, founded a convent in Gaul (360); but in 371 he was made bishop of Tours. He was highly honored, not only in France, but in Germany, Scandinavia, and especially in early Britain. His festival is Nov. 11, and his name appears in the term Martinmas. Consult Cazenove's *Sts. Hilary and Martin*; Scullard's *Martin of Tour*; Bernoulli's *Die Heiligen der Meroving*; Mannix' *Patron Saints* (1907).

Martin, Thomas Commerford (1856-1924), American electrician, author, and editor, was born in London, England. He was editor of the *Electrical World* from 1883 to 1909; special expert in the U. S. Census Bureau from 1900 to 1911; and has been secretary of the National Electric Light Association since 1909. He served on the committee appointed by engineering societies to administer the fund of \$1,500,000 given by Mr. Carnegie for engineering buildings in New York City; and was president of the American Institute of Electrical Engineers, the Engineers' Club of New York, and the New York Electrical Society. He has written *The Electric Motor and Its Applications* (1886); *Edison—His Life and Inventions* (with F. L. Dyer, 1910), etc.

Martineau, Harriet (1802-76), English miscellaneous writer, sister of James Martineau, was born in Norwich. She wrote a series of tales, *Illustrations of Political Economy* (9 vols., 1832-34), followed later by three volumes of *Forest and Game-Law Tales* (1845-6). These had an immediate success. She visited America in 1834-6. On her return she published *Society in America* (1837),

and *Retrospect of Western Travel* (1838). Later works include *Deerbrook* (1839); and *Life in the Sick Room* (1843); *Letters on the Laws of Man's Social Nature* (1851); *History of the Thirty Years' Peace* (1849). Consult her *Autobiography*; Mrs. Fenwick Miller's *Life*.

Martineau, James (1805-1900), English Unitarian divine, brother of Harriet Martineau, was born in Norwich. In 1840 he was appointed professor of mental and moral philosophy and political economy in Manchester New College, a position which he held for forty-five years. He published the first series of *Endeavors After the Christian Life* in 1843, and the second in 1847. In 1853 Manchester New College was transferred to London, and Martineau accepted (1858) a call to Little Portland Street Chapel. In 1869 he became principal of the college.

Martinelli, Giovanni (1885-), was born in Montagnana, Italy. From 1910-13 he sang in Italy and since that time has been a leading tenor of the Metropolitan Opera Co. He has also appeared in opera in Buenos Aires and principal cities of Europe and has sung in summer opera in Rannia, Ill.

Martini, Frederic (1832-97), inventor of the breech action of the Martini-Henry rifle, was born in Switzerland. See **RIFLE**.

Martinique, island, Lesser Antilles, French West Indies. It is traversed by a mountain range which culminates in Mont Pelée (4,426 ft.), clothed with forests. The climate is hot and moist. The chief products are sugar cane, cocoa, coffee, vanilla, bananas, cassia, and fruit. The two industries of importance are the manufacture of sugar and rum. The island is administered by a governor and a general council, and sends a senator and two deputies to the French Parliament. Fort de France, the most important port, is also the political capital and headquarters of the French navy in the West Indies. Martinique was first settled by the French in 1635. The Empress Josephine was born near Fort de France. In May, 1902, an eruption of Mont Pelée destroyed the commercial capital, St. Pierre (p. 26,000, all of whom perished in the eruption). Area 381 sq. m.; p. 244,439. Consult Lafcadio Hearn's *Two Years in the French West Indies*; Légiér's *La Martinique et la Guadeloupe* (1905).

Martinmas, the feast of St. Martin of Tours on Nov. 11. It is one of the legal terms in Scotland.

Martyr, one who lays down his life for his faith. In the early ages of the Christian

Church there was an enthusiasm for martyrdom, and great honor was paid to martyrs at their festivals. (See **MARTYROLOGY**). Consult Mason's *Historic Martyrs of the Primitive Church* (1905).

Martyrology is a calendar of martyrs. A *Depositio Martyrum* was in existence as early as 354 A.D.; and a Syriac martyrology of 412 A.D. has been found. The *Martyrologium Hieronymianum* seems to be the source of all the Western calendars which followed it, and the *Parvum Martyrologium Romanum* adds days for the celebration of the anniversaries of Scripture saints. In the 8th century the Venerable Bede drew up two martyrologies, one in prose and the other in verse. Baronius' martyrology (1586) was widely received, and was sanctioned by Pope Sixtus v. This has since been accepted as the martyrology of the Roman Catholic Church.

Marvell, Andrew (1621-1678), English poet and satirist, was educated at Trinity College. He favored Cromwell, and his *Poems on Affairs of State* satirize Charles II.

Marvin, Charles Frederick (1858-1943), Amer. meteorologist, was born in Putnam, Ohio. He was appointed on the civilian corps of the signal service (1884), and became professor of meteorology in the United States Weather Bureau. He was chief of this Bureau from 1913 to 1934. He has invented instruments which measure and automatically record rainfall, snowfall, sunshine, and certain atmospheric conditions; has made important investigations of anemometers, for the measurement of wind velocities and pressures; and has conducted experiments with regard to moisture, upon the results of which the Weather Bureau bases its tables.

Marx Brothers, actors and musicians. The Four Marx Brothers really are five—Julius (Groucho), Arthur (Harpo), Leonard (Chico), Milton (Zeppo) and Herbert, who succeeded to Zeppo's role. They were vaudeville comedians until 1923 when they appeared in *I'll Say She Is*. Other successes in which they played included *The Cocoanuts*, *Animal Crackers*, *Horse Feathers* and *Monkey Business*. They proved popular both on the stage and in the films. They were the sons of Samuel Marx, an Alsatian immigrant who worked as a tailor in New York's East Side.

Marx, Heinrich Karl (1818-83), German socialist, was born in Treves, of Jewish parents. He migrated to Paris, where he became acquainted with the writings of Proudhon, which converted him to socialism, and formed his life-long friendship with Engels. The

publication of a journal *Vorwärts* led to his expulsion from France. He took up his permanent residence in London, and became a correspondent for various newspapers and magazines, among them the *New York Tribune* and *Putnam's Monthly*. In 1859 appeared *Zur Kritik der politischen Oekonomie*; but it was not until 1867 that he launched the first volume of *Das Kapital*, which has become the text book of modern socialism. The second volume (completed by Engels) appeared in 1885, and the third in 1895. In 1864 the International was founded, embodying Marx' ideas. Marx himself never held higher office in it than corresponding secretary for Germany; but he was its real head, and inspired all its documents and appeals to the people. See INTERNATIONAL, THE; SOCIALISM. Consult Aveling, *Student's Marx*; Spargo's *Karl Marx: His Life and Work* (1911).

Mary the Virgin, the mother of Jesus. The particulars given in Scripture regarding her are singularly few. We learn that while she was betrothed to Joseph, a carpenter of Nazareth, the archangel Gabriel announced to her that she was to become the mother of the Saviour; and in due time, while on a visit to Bethlehem, she brought forth her first-born son, conceived of the Holy Ghost. Meanwhile her marriage with Joseph had taken place; and after the Child's circumcision in the Temple, the family sojourned for a while in Egypt, afterward settling for a time at Nazareth. After this we have only occasional glimpses of Mary. After the crucifixion she lived in the house of John. Around this nucleus, however, have gathered many apocryphal details about the Virgin, as set forth in the *Protevangelium Jacobi*, *Evangelium Thomæ*, and *Historia de Nativitate Mariæ*. Her death is variously put at two, eleven, twenty-two, or thirty-three years after the resurrection; her reputed tomb lies immediately to the North of Gethsemane, though her body is said to have been carried to heaven by angels. Consult Clark's *Ante-Nicene Christian Library* (vol. xvi.); Newman's *Development of Christian Doctrine*; Liguori's *Glories of Mary*; Mrs. Jameson's *Legends of the Madonna*; Meynell's *Life of the Virgin Mary* (1906); Wilim's *Mother of Jesus* (1906); Benziger's *Lays and Legends of Our Blessed Lady* (1911); Benedict's *Our Lady of Understanding* (1911).

Mary I. (1516-58), queen of England and Ireland, daughter of Henry VIII. and Cath-

erine of Aragon. In 1554 she gave her hand in marriage to Philip II. of Spain. She was in personal danger till Anne Boleyn's death (1536), but was befriended by Jane Seymour. On the death of Edward VI., in 1553, she entered London with acclaim; received Pole as papal legate; crushed Wyatt's rebellion with ruthless severity; instituted the persecution of 1555, wherein 300 victims suffered; and lost Calais in 1558.

Mary II. (1662-94), queen of Great Britain and Ireland, wife of William III. She became heiress-presumptive to the throne (1671), and was married to William, Prince of Orange (1677).

Mary of Guise (1515-60), daughter of Claude, Duke of Guise, became the wife of James V. of Scotland in 1538, and was the mother of Mary Queen of Scots.

Mary, Queen, consort of George V. of England, was born in Kensington Palace on May 27, 1867. She is the daughter of the Duke and Duchess of Teck. On July 6, 1893, her marriage to George, Duke of York, now George V., took place. In 1901, along with the Duke, she made a prolonged tour through the colonies, and on their return they were created Prince and Princess of Wales. During 1905-6 the Prince and Princess toured throughout India. As Duchess of York and as Princess of Wales the Queen took part with her husband in numerous public and state functions. She was crowned, with George V., in Westminster Abbey, June 22, 1911.

Mary Queen of Scots (1542-87), only daughter of James V. of Scotland and Mary of Guise, was born in Linlithgow Palace, and became queen when only a week old. All the more important years of her early life were spent in France, where she was educated with the royal children. In 1558 she was married to the Dauphin. On the death of Mary of England, in November, she formally claimed the succession to the English crown on the ground of Elizabeth's illegitimacy. The death of her husband on Dec. 5, 1560, led to her return to Scotland. Mary gave her hand to Lord Darnley, on July 29, 1565. Lacking character and ability, the latter found himself suddenly superseded in Mary's counsels by the Italian Rizzio; and by aiding the conspiracy for Rizzio's assassination (March 9, 1566), gave his wife offence almost beyond pardon. In addition to this, Mary's political necessities had compelled her to have recourse to the aid and almost protection of Bothwell. Everything

avored the rapid growth of her passionate devotion to him, and riddance from Darnley became a matter of importance to both. Who were mainly responsible for the suggestion of the assassination cannot now be exactly determined; but Bothwell undertook the main arrangements for its accomplishment. Darnley was murdered in the Kirk o' Field on Feb. 10, 1567.

Besides conniving at the murder, the Protestant leaders cooperated—either passively or actively—with Mary in arranging that the trial of Bothwell should result in his acquittal. But after her marriage to Bothwell, on May 15, they took up arms—avowedly to deliver her from him. This re-



Queen Mary of England.

sulted in her surrender to them. Mary was escorted as a prisoner to Edinburgh; and was sent to the castle of Lochleven, from which she escaped May 2, 1568. On May 13, however, her forces were defeated, and Mary fled across the Solway into England, where she was imprisoned by Elizabeth. Nineteen years were spent by Mary as a prisoner—until her execution. Mary met her fate (Feb. 8, 1587) with unshaken fortitude.

Consult Lang's *The Mystery of Mary Stuart* (1901); Stoddart's *The Girlhood of Mary Queen of Scots* (1908); Abbott's *Mary Queen of Scots* (1910). Numerous dramas have been written about her, notably by Schiller, Dumas, and Björnson (1912).

Maryland (named for Henrietta Maria, wife of Charles I. of England; sometimes called the 'Old Line State'), a South Atlantic State of the United States, one of the original thirteen. It is bounded on the n. by

Pennsylvania and Delaware; on the e. by Delaware and the Atlantic Ocean; and on the s. and w. by Virginia and West Virginia. Mason and Dixon's Line marks its northern boundary, and the Potomac River most of its southern boundary. The total area is 12,327 sq. m., of which 2,386 are water surface.

Maryland lies in three topographic regions—the Coastal Plain, the Piedmont Plateau, and the Appalachian Plateau. The Coastal Plain embraces about 8,500 sq. m., lying s. and e. of a line running from Washington through Baltimore to the northern border. This region is divided by Chesapeake Bay, which cuts into the land in numerous estuaries, furnishing excellent harbors. The Catocin Mountains mark the western boundary of the Piedmont Plateau. This region embraces about 2,500 sq. m., and is broken into hills and valleys, which increase in roughness toward the w. The Appalachian Plateau, having an average elevation of 2,500 ft., comprises the long, narrow strip of land in the western part of the State. It is crossed by numerous mountain ridges, notably the Blue and Allegheny, separated by narrow valleys. Most of the western portion of the State is drained by the Potomac River. The Susquehanna River enters Chesapeake bay at its head.

The temperature varies greatly in different parts, owing to wide differences in elevation, some differences in latitude, and the varying distance from the sea. Owing to the fact that the various geological formations of the Appalachian, Piedmont, and Coastal regions here run parallel, in comparatively narrow strips, Maryland has a remarkably complete series of geological strata. Bituminous coal, mined in the extreme western counties, constitutes the greatest mineral wealth. Clay, used in pottery, bricks, and tiles; sand and gravel; basalt; limestone; and slate, are among the important products.

Maryland has 4,000 acres of national forest and 16,068 acres of State forest. The total wooded area is 39,978 acres. Oak and chestnut, maple and other hard woods are found.

Chesapeake Bay and its tributary waters form the greatest oyster area in the world, and oysters constitute the larger part of the State's fishery product. Shad, soft crabs, alewives and hard crabs are important catches.

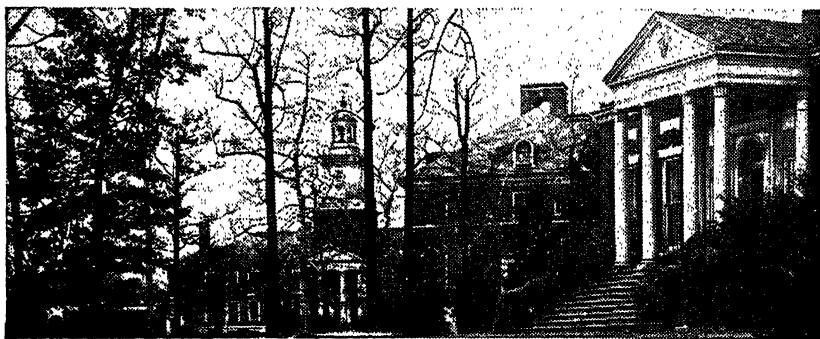
Its wide range of soil and climate conditions adapt the State to a great variety of

agricultural products. In the upland portions of the southern counties, on the eastern shore, are grown general farm crops, vegetables and tree fruits; the northern counties are suitable for cereals, grasses, fruits and vegetables; while the plateau region is especially adapted to grass, wheat, corn and tomatoes. The principal crops are corn, wheat, hay and forage, white potatoes, tobacco, sweet potatoes, rye and barley. Maryland ranks high as a producer of tomatoes, and cans more tomatoes than any other State in the Union, amounting to about 35 per cent of the United States' output. The canning of fruits, oysters and crabs is also important. Fruits are another valuable product, especially apples, grapes, peaches, pears, plums and cherries. Poultry raising is also carried on quite extensively in some sections of the State. The

Separate schools are maintained for white and colored children, and attendance is compulsory.

Institutions of higher learning include Johns Hopkins University, and Goucher College, for women, at Baltimore; Western Maryland College, at Westminster; Washington College, at Chestertown; University of Maryland, at College Park; St. John's College, at Annapolis; Mount St. Mary's College, at Emmittsburg; Notre Dame College of Maryland, at Baltimore (publicly controlled). The U. S. Naval Academy is located at Annapolis.

The present constitution of Maryland was adopted in 1867, and has been frequently amended. A governor, elected for four years, appoints—with the consent of the Senate—some of the other State executive officers. The



Johns Hopkins University, Baltimore.

manufacture of clothing is by far the most important industry. Other industries which have shown a large recent growth are slaughtering and meat packing, the manufacture of tin cans and other tinware, railroad shop construction and repair work and fertilizers.

Baltimore, the chief city, is the second ranking seaport in the United States, and sixth in the world in net register tons.

The population of Maryland according to the U. S. Census for 1940 was 1,821,244. Of this total, foreign-born whites numbered 95,093; Negroes, 276,379; Chinese, 492; Indians, 50; Japanese, 38; and Filipinos, 327. Of the total population 59.3 per cent. was urban.

Maryland has a State Superintendent of Education appointed for four years by the State Board of Education, which consists of seven members, appointed by the governor. County superintendents and supervisors are appointed by county boards of education.

legislature consists of a Senate, chosen for four years, and a House of Delegates, chosen for two years. Under the Reapportionment Act, Maryland has 6 Representatives in the National Congress. Annapolis is the State capital.

The grant of the present State of Maryland, including Delaware, was made in 1632 by Charles I. to George Calvert, first Lord Baltimore, a Catholic, who, having been a member of both the London and Plymouth Companies, was deeply interested in the English colonization of America. The chief purpose of Lord Baltimore in founding the new colony was to provide a place where Catholics should be unmolested in their religious beliefs, and where religious toleration should be practised. Before the signing of the charter, Lord Baltimore died, and was succeeded in both title and rights by his son Cecilius.

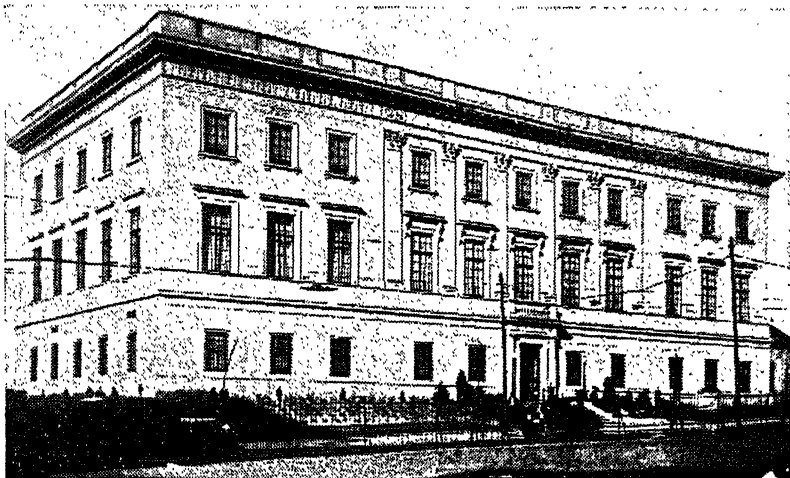
In 1634 the first party of colonists, numbering about two hundred, under the leader-

ship of Leonard Calvert, brother of Cecilius, landed at Point Comfort, Virginia; and on March 27 they laid out, near the mouth of the Potomac, the city of Saint Mary's. In February, 1635, the first assembly met at Saint Mary's, and its members, the freemen, adopted a code of laws which was later rejected by Lord Baltimore. In 1638 the latter drafted a code, which was vetoed by the assembly. The deadlock thus created was settled by a compromise, and statutes were adopted in 1638 and 1639.

A noteworthy step in the history of religious liberty was the passage, in 1649, of the Toleration Act, guaranteeing freedom of worship to all followers of Christ. The great in-

at Annapolis, which recommended the holding of a convention for the purpose of drafting a constitution for the United States; and in 1788 the Federal Constitution was adopted by the Maryland Convention. In the Civil War, Maryland's sympathies were divided. Industrially she was a slave State. Many of her citizens favored secession, and joined the Confederate army. Her position, however, favored adherence to the Union, and Union sentiment prevailed, thus saving Washington to the Federal Government. On Sept. 16-17, 1862, the Battle of Antietam was fought on Maryland soil.

Consult Mereness' *Maryland as a Proprietary Province*; Andrews' *History of Mary-*



Johns Hopkins University: Welch Medical Library.

crease in numbers and the continued hostility of the Puritans made it expedient to give them a separate settlement; and accordingly Anne Arundel and Charles counties were organized for them. In 1694 the capital was removed from St. Mary's to Annapolis. Baltimore was founded in 1730, Frederick in 1745, and Georgetown in 1751. The trouble over the Pennsylvania boundary was settled, after more than half a century of dispute, by the surveying of Mason and Dixon's Line from 1763 to 1767. The location of the Virginia boundary was not finally settled until 1930.

In the struggle for independence Maryland took an early and active part. In 1781 Maryland became a member of the Confederation; in 1783 Congress met at Annapolis; in 1786 an interstate convention was held

at Annapolis, which recommended the holding of a convention for the purpose of drafting a constitution for the United States; and in 1788 the Federal Constitution was adopted by the Maryland Convention. In the Civil War, Maryland's sympathies were divided. Industrially she was a slave State. Many of her citizens favored secession, and joined the Confederate army. Her position, however, favored adherence to the Union, and Union sentiment prevailed, thus saving Washington to the Federal Government. On Sept. 16-17, 1862, the Battle of Antietam was fought on Maryland soil.

Maryland, University of, a non-sectarian, co-educational State institution, located at College Park, Maryland, organized in 1920 from the University of Maryland, which was founded in 1807, and the Maryland State College, chartered in 1856.

Maryland Yellowthroat (*Trichas Marylandica*), a small warbler frequenting low bushes and watercourses in the Southern United States. It builds its nest on or near the ground, and lays three to five whitish, spotted eggs. In color it is olive green, with a broad band of black across the head, and with bright yellow throat and breast.

Mary Magdalene, one of the associates of Jesus and His disciples. Her name suggests

that she belonged to the town of Magdala, now Mejdol, near Tiberias.

Masaccio, whose real name was **Tommaso Guidi** (1401-28), was a Florentine painter, born near Florence. Little is known of his life. His principal works are *The Trinity*, a fresco in the church of Santa Maria Novella, and the famous frescoes (including *The Tribute Money* and *The Expulsion from Paradise*) in the Brancacci Chapel—the latter finished after his death by Filippino Lippi. His realism in characterization, noble simplicity in composition, comprehension of anatomy and perspective, and rendering of spatial values delivered Italian painting from the formalism of Giotto's successors, and marked an important advance over Giotto himself. Consult Creutz' *Masaccio*.

Masailand, region, East Africa, stretches w. to Victoria Nyanza, and is traversed from n. to s. by a remarkable volcanic fault, known as the Rift Valley, reaching a depth of 2,000 ft. below the plateau. In the south are Lakes Naivasha and Baringo, and in the n. Lake Rudolf. The Masai are a nomad, pastoral people, who occupied the valley, with negro populations on either side. They have been greatly modified by contact with negroes and Bantus. Their power was broken by the loss of their cattle during the epidemic of the nineties. They have now accepted British rule, and are included in the British East Africa Protectorate.

Masaryk, Thomas Garrigue (1850-1937), Czechoslovakian statesman, educated at University of Vienna. He became privatdozent of philosophy in that university in 1879 and professor at the University of Prague in 1882. He was a member of the parliament of Vienna from 1891 to 1893. At the outbreak of the Great War he fled to Italy and then to Switzerland, finally settling in London. He was the prime mover in the Czechoslovak movement for Independence and president of the Czechoslovak Republic from 1918 until resigning in 1935. He is the author of *The Problem of Small Nations in the European Crisis* (1915); *The Spirit of Russia* (1919); *The Making of a State* (1925).

Masbate, main island of Masbate province, Philippine Islands; 30 m. s. of Luzon. Length, n.w. to s.w., 84 m.; width, n.e. to s.w., 45 m. It is mountainous and well wooded. Lignite, gold, and copper are found. The chief agricultural products are cotton, chocolate, sugar cane, and hemp. The principal industries are lumbering, fishing, and the manufacture of palm mats and sugar sacks. The export of

live stock to Manila and other points in the archipelago is considerable. Masbate, the capital (p. 10,821), is 285 m. s.e. of Manila. Area, 1,255 sq. m.

Mascagni, Pietro (1863-1945), Italian operatic composer, was born in Leghorn. He studied at the Milan Conservatory, and later became director of the Municipal School of Music at Cerignola. Although he has attained prominence as a conductor, he is best known by his popular one-act opera, *Cavalleria Rusticana* (1890), the libretto of which is an adaptation of Giovanni Verga's *Novelle Rusticane* (1883). He visited the United States in 1902, his tour meeting with indifferent success. His operatic works include *L'Amico Fritz* (1891); *I Rantzau* (1892); *Silvano* (1895); *Iris* (1898); *Les Maschers* (1901); *Amica* (1904); *Isabeau* (1911); *Parisina* (1913); *Il Piccolo Marat* (1921).

Masefield, John (1878-), Poet-Laurate of England since 1930, dramatist and novelist, was born at Ledbury, Herefordshire. At the age of thirteen he joined the training-ship *Conway* and two years later was indentured to the captain of a merchantman. In these voyages he acquired the material for



John Masefield.

his poems of the sea. He was in New York (1895-97) doing odd jobs to make a living and reading much poetry. Returning to England, he turned to the career of poet, becoming a contributor to various London publications. Masefield's best work is found in his ballads and narrative poems of the sea, intensely realistic and full of pathos. His works include: *Salt Water Ballads*; *The Everlasting Mercy*; *The Widow in the Bye-Street*; *Dauber* (considered by many his best narrative poem); *The Daffodil Fields*, etc. Later

works are: *The Hawbucks* (1929); *The Wanderer of Liverpool* (1930); *Helen of Troy* (1932). Among recent plays are *Tristan and Isolde* (1927); *The Coming of Christ* (1928); *The Taking of the Gry* (1934); *In the Mills* (1941). Consult Simmons' *A Bibliography of John Masefield* (1930).

Mashonaland, division of Southern Rhodesia, British South Africa, between Matabeleland and the Zambezi. It is an upland savanna country (altitude 3,000 to 5,000 ft.), with a fertile soil. In recent times the Mashonas proper suffered much from the raids of the Matabele, and were compelled to lead the life of Troglodytes in their mountain fastnesses before the establishment of orderly government by the British South African Company in 1893. Dr. Jameson was one of the first administrators, and conducted the war against the Matabele (1893). Since then the Mashonas have left their cave dwellings and resumed their industrial pursuits; p. 497, 165, and 12,543 Europeans. See BANTU; RHODESIA.

Mask, a covering for the face, generally grotesque. Savage tribes have used them to frighten their enemies or evil spirits. The story of the Gorgon's head is probably a myth of the mask. In ancient Greece and Rome masks were used in funeral processions, at the feasts of Bacchus (Dionysus), and on the stage, the adaptation for the latter purpose being assigned to Æschylus. They represented different ages and types of character, and were fitted with a voice tube to make the actor's words audible in the immense theatres of the time.

In Italy masks were worn in the 16th century in comedy, and they still survive in pantomime and carnival. The carved masks of the Nô dance of Japan have been of a high order of workmanship. The use of masks in religious ceremonies is common in China, Siam, India, and among the Indians, Eskimos, and African negroes. For the play so called, see MASQUE.

Maso, Bartolomé y Marquez (1834-1907), Cuban patriot, took active part in the rebellion of 1868-78, was arrested by the Spanish authorities, and sent as a convict to the Chefarine Islands. He joined the revolutionists in 1895, and was made vice-president of the Cuba Republic the same year, and president in 1897.

Mason, Alfred Edward Woodley (1865), English novelist and playwright. After several years on the stage, he devoted himself to literature. His works include: *The*

Philanderers (1897); *Parson Kelly* (with Andrew Lang, 1899); *The Broken Road* (1907); *Marjorie Strobe* (1910); *The Turnstile* (1912).

Mason, Daniel Gregory (1873-), American musician and lecturer on music, was born in Brookline, Mass. He studied music at the Boston Conservatory, and in New York and Paris. He has composed chamber music, songs, and piano pieces, but is best known by his lectures on music and through his books, and as professor of music at Columbia University.

Mason, George (1725-92), American political leader, was born in Virginia. During most of his life he devoted himself principally to the management and cultivation of his large estates, which lay near those of George Washington, with whom he maintained a close personal friendship. Mason was the author of the non-importation resolutions presented to the Virginia legislature by George Washington in 1769, and of the so-called Fairfax county convention in July, 1774. In 1776 he drafted the Virginia State constitution and the Virginia Bill of Rights; and for many years after 1776 he was again a member of the Virginia legislature. He was a prominent member of the Constitutional Convention at Philadelphia (1787).

Mason, James Murray (1798-1871), American legislator. From 1847 to 1861 he represented Virginia in the U. S. Senate. For ten years he was chairman of the Committee on Foreign Relations; and he was the author of the Fugitive Slave Law of 1850.

Mason, Jeremiah (1768-1848), American lawyer and U. S. Senator. In 1802 he became attorney-general of New Hampshire. In 1807 Daniel Webster began to practise law in Portsmouth, and he shared the leading cases with Mason, who became his intimate friend. From 1813 to 1817 the latter was a member of the U. S. Senate, and took an active part in the debates on important questions arising from the war with England.

Mason and Dixon's Line, the boundary line between Pennsylvania and Maryland along the parallel of 39° 43' 26.3", run by two English surveyors, Charles Mason and Jeremiah Dixon, in 1763-67, and settling a long dispute between the Penn and Baltimore families, proprietors respectively of Pennsylvania and Maryland. It was re-surveyed after 1901. The phrase 'Mason and Dixon's Line' is often used in United States history to indicate the dividing line between the free and slave States before the Civil War. The

actual dividing line, after leaving the Maryland-Pennsylvania and Virginia (now West Virginia) boundaries, followed the Ohio River to the Mississippi, and thence (Missouri, a slave state, being excepted) the parallel of 36° 30', established by the Missouri Compromise. After the war the term continued to be used to designate the dividing line between South and North.

Mason City, city, Iowa, county seat of Cerro Gordo co., the intersection point of the Jefferson and the Atlantic-Yellowstone-Pacific Highways. Mason City is the center of an agricultural region, which produces grain, fruit, live-stock, and poultry. Industries include sand and gravel quarries, cement plants, lime, brick, and tile works, a packing house, sugar beet factories, foundries, and the manufacture of wood products; p. 23,304.

Masonry, a term applied to building construction in which the materials used are stone, cement blocks, brick, tile, terra cotta, and the like, laid with or without mortar, and also to the art of erecting such construction. Masonry forms a substantial part of practically all buildings; even where the upper structure is of wood the foundation and chimneys are put in place by masons. It constitutes the greater part of most dams, many bridges and the abutments, piers and towers of most others, retaining walls for earthworks, arches, buttresses, conduits, aqueducts, viaducts, lighthouses, sea walls, etc.; in architecture it attains its highest expression in great domes and vaulted ceilings, cathedrals, and monumental structures. A great deal of work that formerly fell to the mason is now built in monolithic form of concrete.

The strength of stone masonry depends chiefly upon the kind of stone used and the accuracy of its cutting and placing in the work.

Masonry. See **Freemasonry**.

Maspero, Sir Gaston Camille Charles (1846-1916), French Egyptologist. In 1880 he headed the French government's archaeological mission to Egypt and the following year became director of excavations. From 1899 to 1914 was again director of excavations in Egypt. Among his many important publications which have been translated into English are *The Dawn of Civilization: Egypt and Chaldea* (1897); *Struggle of the Nations*; *A Complete History of Egypt* (12 vols., 1904); *New Light on Ancient Egypt* (1909); *Art in Egypt* (1912).

Masque, or **Mask**, a form of dramatic en-

tertainment in favor at the English court in the 16th and 17th centuries. Its most distinctive characteristic was the dance, and to this all else, such as dialogue and singing, was subsidiary. The performance of masques is repeatedly recorded during the reigns of Henry VIII. and Elizabeth, and also, but less frequently, in the time of Edward VI. and Mary. Ben Jonson was the greatest of English masque writers. His elaborate devices contain the daintiest poetry and the most ingenious erudition. Other masque writers are Samuel Daniel, Thomas Campion, William Browne, Thomas Carew, James Shirley, and Milton, with *Comus* (1634). The influence of the masque may be traced in the spectacular visions introduced into some of Shakespeare's plays and in the conception of *A Midsummer Night's Dream*.

Masquerade, a ball or other entertainment where masks are worn.

Mass, the magnitude which is inseparably associated with each and every particle of matter when it is to be made the object of dynamical discussion. Newton called it the quantity of matter.

Mass (Latin *missa*), a term once universally applied to the liturgy or office for the celebration of the Eucharist, now used chiefly in the Roman Catholic Church. It is the regular and familiar term of the Roman Catholic Church, and implies their doctrines of the real presence and transubstantiation and the sacrificial character of the Eucharist. Hence it can be offered only by one in priest's orders, who must be fasting. Private masses which are recited are called low; a High Mass is sung, and if the celebrant has assistants it is called Solemn. Pontifical, Requiem, and Nuptial Masses are those celebrated by a bishop, for the dead, and at marriages, respectively.

The Music of the Mass, when sung, was originally plain chant. Since the latter part of the 14th century it has consisted of six movements—the Kyrie, Gloria, Credo, Sanctus, Benedictus, and Agnus Dei. The whole work is usually founded upon a single theme which is frequently the melody of one of the ancient unisonal plain chants used in the service of High Mass from a remote period. Near the close of the 17th century the introduction of instrumental accompaniment, and the subsequent adoption of the system of tonality, resulted in the Mass becoming a form of sacred cantata, which in some instances approximates the proportions of an oratorio. In this style are the stupendous

masses of Bach in B minor, Beethoven in D, and Cherubini in D and A. Of less grandeur, though full of beautiful music, are those of Haydn, Mozart, Weber, Schubert, Gounod, Verdi, Dvorák, Berlioz and Sir George Henschel. Pope Pius x. undertook to enforce greater simplicity in church music. He insisted upon a return to the sacred traditions of plain-song and sought to have choirs include, as far as possible, only male voices.

Massachusetts (Indian, 'near the great hills'; popularly known as the 'Old Colony State' and as the 'Bay' or 'Old Bay State'), one of the thirteen original States of the United States, belonging to the New England group. It is bounded on the n. by New Hampshire and Vermont, on the e. by the Atlantic Ocean, on the south by Connecticut, Rhode Island, and the ocean, and on the w. by New York. It has a total area of 8,266 sq. m., including 227 of water.

The State is divided into two general portions by a height of land crossing it from n. to s. at about longitude 72° e. Eastward of this divide the slope is undulating, and downward toward the e. and s.e. The southeastern portion of the State, including the islands of Martha's Vineyard and Nantucket and the Elizabeth Islands, is quite low and sandy, and in some places marshy. The Cape Cod peninsula marks the northernmost limit of the Atlantic Coastal plain, and is composed entirely of glacial drift. West of the central divide is a plateau, sloping toward the Connecticut River. West of this river the surface is hilly and broken by the Berkshire Hills and the Hoosac and Taconic Mountains. Between these ranges lie the valleys drained by the Hoosac and the Housatonic Rivers—the former flowing northwestward into the Hudson, the latter southward into Long Island Sound. This region is picturesque and beautiful, and its hills are well suited to dairy farming. It is a favorite summer resort section. The eastern and southern shore lines are indented by numerous bays, the chief of which are Massachusetts Bay, Cape Cod Bay, and Buzzards Bay. There are 69 islands along the coast. The rivers of the State are especially noteworthy for their utilized water power. Besides those above mentioned, in the w. and flowing into the Connecticut are the Westfield, Deerfield, Miller's, and Chicopee; in the e. are the Merrimac and its tributaries, the Concord and the Nashua, the Charles, Blackstone, Taunton, and numerous smaller streams.

The temperature is generally low, the win-

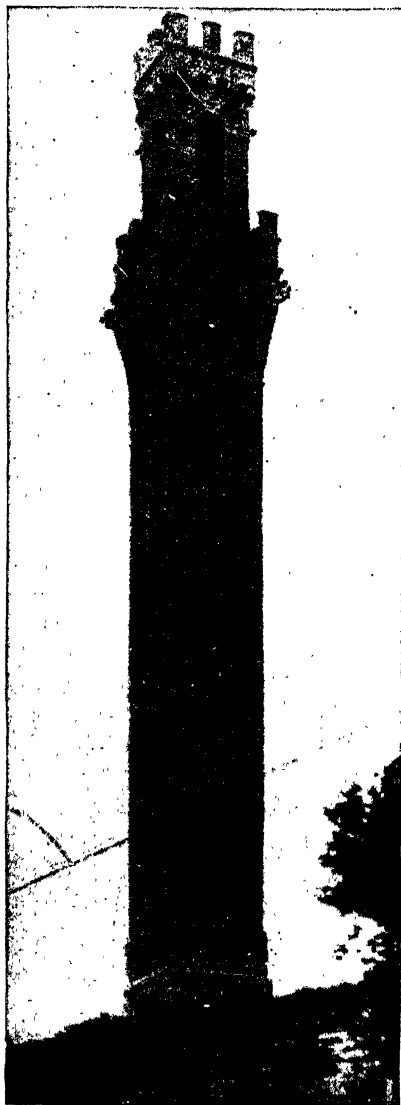
ters being usually quite cold and rigorous, and the summers moderately cool with occasional hot spells. The prevailing winds from January to May are from the n. and n.w., and from June to November from the s. and s.w. The snowfall is comparatively heavy, varying from 30 to 60 inches from the s.e. to the n.w. The chief mineral deposits are the building stones found in various parts of the State, especially in the Connecticut Valley, and the rich beds of clay of the river valley and the southeastern coast. Granite quarrying is the leading mining industry, and in the value of this product Massachusetts holds a high place. Other mineral products are basalt, marble, silica, clay, fullers' earth, iron ore, limestone, sandstone, talc, and soapstone. Massachusetts was originally covered with forests of conifers, mixed with hardwoods; but most of the virgin forest has been cut, and now the cutting is largely confined to second growth. It has made notable progress in reforestation.

Since the earliest days of colonial history the fisheries of Massachusetts have been of great importance. For many years Gloucester was the leading fishing port in the country, but by 1931 Boston had attained that distinction. The other ports are Provincetown, New Bedford, Nantucket and Edgartown. The fishing industry keeps about 500 vessels in service and gives employment to some 10,000 men, and the annual catch amounts to approximately 330,000,000 pounds of fish, which sell for about \$9,000,000. In salt and cured fish Gloucester still holds the lead. The principal products are cod, haddock, mackerel, clams, lobster, flounders, pollock, scallops, halibut, oysters, hake, swordfish and whiting. The deflection of the Gulf Stream caused by the curved peninsula, Cape Cod, produces a remarkable phenomenon. South of the peninsula, the marine fauna is distinctly southern in type, while that on the northern side is quite different, being faunally characteristic of colder regions.

Massachusetts has been undergoing ever since about 1850, a process of acreage reduction of cultivated lands. This decrease in improved farm area is due largely to the competition of Western lands in the growing of cereals. At the same time the increase of the urban population in Massachusetts and adjoining States has made more profitable the raising of fruits and vegetables and the production of milk and butter.

Massachusetts is pre-eminently a manufacturing State, the superior water-power ad-

vantages which it affords having been largely instrumental in bringing about the early establishment of a number of important mills



*Copyright by Ewing Galloway, N. Y.
Pilgrim Memorial Monument, Provincetown, Mass.*

and factories. The extensive system of railroads in the State connects its various manufacturing districts with its leading industrial centers and those of other States. Boston,

the fourth seaport of importance on the Atlantic Coast, affords excellent opportunities for domestic and foreign commerce; and several other cities and towns have good water facilities.

Textiles.—Massachusetts is one of the foremost States in the Union in the production of all textiles combined, including three of the most important branches—cotton goods, including cotton small wares; woolen and worsted goods, and jute goods. It ranks high in the production of shoddy, of cordage and twine, of linen goods, of felt goods and of woolen hats, and in that of hosiery and knit goods and of carpets and rugs, and also in that of silk and silk goods, and of fur-felt hats.

Boots and Shoes, including Cut Stock and Findings.—Massachusetts continues to lead all other States of the Union in the combined industry.

Foundry and Machine-Shop Products.—This classification covers products of great diversity, embracing not only the output of foundries and machine shops, but also that of establishments engaged in the manufacture of gas machines and gas and water meters, hardware, plumbers' supplies, steam fittings and heating apparatus, and structural iron work.

Printing, publishing and engraving are also important industries. The State has an unusually large number of manufacturing cities, many of which are noteworthy as the centres of localization of certain industries. Thus, Fall River, Lowell, New Bedford, Lawrence, and Taunton are textile manufacturing centers; Brockton, Lynn, and Haverhill have long been known throughout the country as outstanding in the manufacture of boots and shoes; Hampden county (cities of Holyoke and Springfield) is the center of the paper and wood-pulp industry. Lawrence contains some of the largest woolen and worsted mills in the world. Clinton, Cambridge and the region near Boston are printing and publishing centers. Boston is by far the largest manufacturing center in the State.

Transportation.—It is generally believed that the first railroad in the United States was a short stretch of track on Beacon Street, Boston, laid in 1807. In 1826 a tram road 3 miles in length was built for hauling granite from the granite quarries at Quincy to Newport. This was the practical beginning of railroad construction in the United States. In 1835 a steam-railroad was begun from Boston to Quincy. The State highway system is now

one of the finest in the country. A vast network of motor bus routes connects cities and smaller communities within the State, as well as with Connecticut, New York, Rhode Island, Maine, New Hampshire and Vermont. The State has a fine airport at Boston as well as others in the State, with constant service to New York and various New England cities.

The history of trade dates from the very earliest days of the Massachusetts Colony. The splendid facilities for shipbuilding were early taken advantage of, and until the Civil War the sailing and steam vessels built at Boston and Newburyport carried a considerable proportion of American, as well as much foreign trade. A great domestic and foreign trade is carried on through the ten ports of entry, of which Boston is the leading port, followed by New Bedford, Gloucester, Fall River, Beverly, Salem, and Lynn.

According to the Federal Census of 1940 the population of Massachusetts is 4,316,721, an increase of 67,107, or 1.6 per cent., as compared with the population on Jan. 1, 1930. The average number of inhabitants per sq. m. in 1930 was 528.6, as compared with 479.2 in 1920.

Since the opening of the first free school, the Boston Public Latin School, in 1635, and the founding of Harvard College the year following, much attention has been given to educational matters in Massachusetts. A statute of 1647 provided for the maintenance of public common schools in towns having fifty families, and of grammar schools preparing for college in towns having a hundred families. In 1837 the Central Court appointed a board of education to revise the school laws and to reorganize the common school system of the State. The great educational reformer, Horace Mann, was made secretary of this board, and his twelve years' labor in that position marked the beginning of the common school system as it exists to-day not only in Massachusetts, but in the United States.

The present organization comprises the Department of Education, consisting of numerous divisions, boards, and schools. There is a Commissioner of Education, appointed for a term of five years by the governor, who also appoints an Advisory Board of Education. Attendance is compulsory for children between the ages of seven and fourteen during the time school is in session, and for children between fourteen and sixteen, unless they have completed the sixth grade and have per-

mission from the superintendent of schools to engage in employment. Instruction is provided in English and Citizenship for non-English-speaking adults, the Commonwealth reimbursing the cities and towns for one-half of the cost of instruction; and many towns and cities maintain kindergartens. The law requires manual training to be given in both elementary and high schools in all towns of 20,000 or more inhabitants. Textile schools in Lowell, Fall River, and New Bedford, to which both the State and the local community contribute, deal with the textile industry. The school revenue is derived mainly from taxation and from interest on the State school fund. The education and training of teachers are provided in ten State normal schools. The city of Boston also maintains a normal school. Institutions for higher learning include Harvard University, Cambridge; Williams College, Williams-town; Amherst College, Amherst; College of the Holy Cross, Worcester; Tufts College, Medford; Boston University; Clark University, Worcester; Massachusetts State College, Amherst; Massachusetts Institute of Technology, Cambridge; Worcester Polytechnic Institute; Boston College; Wheaton College, Norton; Northeastern College, Boston; Gordon Bible College, Boston. Among colleges for women are Radcliffe College, Cambridge; Wellesley College, Wellesley; Smith College, Northampton; Mount Holyoke College, South Hadley; and Simmons College, Boston. There are other professional schools in the State, especially of medicine, dentistry, and pharmacy, and well-known music schools in Boston.

The present constitution of Massachusetts is that adopted in 1780, but it has received many amendments. The legislature or General Court consists of a Senate of 40 members and a House of Representatives of 240 members, elected for terms of two years from their respective districts. Regular sessions of the legislature are biennial, convening in January of each odd numbered year. Both the Governor and the Lieutenant Governor are elected for a two year term. The Supreme Judicial Court of the Commonwealth consists of a Chief Justice and six Associates.

Under the reapportionment act Massachusetts has 14 Representatives in Congress. The State capital is Boston.

History.—The history of Massachusetts begins with the landing of the Pilgrims at Plymouth. This band, 102 in number, was part of a company of Puritans, who had left

England because of their desire to be free from the persecutions of the mother country, and had settled at Leyden, in Holland, in 1609. Finding no prospect of a home in Holland, they determined to found one in the New World, and set sail on July 22, 1620, under the leadership of William Brewster. Having landed at Plymouth, England, they again set sail in the *Mayflower* on September 6; arrived off Cape Cod on November 9; and at length landed on Plymouth Rock, Dec. 11, 1620 (date according to New Style, December 21, 'Forefathers' Day' being celebrated on December 22). It was the original intention of the company to found their colony in Virginia (which then extended as far north as the 41st parallel), and a grant of land south of the Hudson had been obtained from the London Company; but storms determined the landing. In November, 1621, the colony was increased by 35 persons brought by the *Fortune*. In 1623 there was another addition of 60 immigrants. In 1624 the property previously held in common was partially divided, and a council of five was chosen to assist the governor. In 1629 a patent was secured, conferring on William Bradford, his heirs, associates and assigns, the title to the land on which Plymouth colony was situated. The governor and council were constituted a judicial court in 1634; in 1639 legislative power, previously in the hands of freemen (churchmen), was vested in a general court; and in 1640 the title to the land was transferred to the colony. By 1643 the colony numbered 3,000. The second colony of Massachusetts was begun in 1626, when Roger Conant withdrew from Plymouth and founded Salem, then called Naumkeag. Two years later John Endicott arrived with 60 recruits. In 1629 a charter was granted to the 'Governor and Company of the Massachusetts Bay of New England.' The year following, 1,000 Puritans under John Winthrop, came to the colony. Many thousands followed in the next few years. Boston was settled in 1630, and became the seat of government. A growing spirit of independence in the colony resulted in several unsuccessful attempts on the part of the English crown to compel the surrender of the charter. In 1643 Massachusetts Bay, Plymouth, Connecticut, and New Haven formed a union, known as the New England Confederacy, to resist unitedly the Indians and Dutch. In 1684 the charter was declared void, General Court was dissolved, and Massachusetts was declared a royal province. In 1686 Sir Edmund

Andros was made royal governor. He ruled with a high hand until William of Orange came to the English throne, when the colonists imprisoned Andros and reinstated the old form of government, which lasted until the new charter uniting Massachusetts Bay and Plymouth colonies in 1692.

Massachusetts was from the beginning interested in educational progress. In 1636 an appropriation of money was made to found a college in Cambridge. In 1642 a system of public schools was organized. In 1639 the first printing press was brought over; and in 1704 the first newspaper, the *Boston News Letter*, was issued. In the various wars waged by the British against the French in America, Massachusetts ably aided the mother country. It also took a leading part in the resistance leading to the Revolution. Its attitude toward the Writs of Assistance and the Stamp Act; the speeches of James Otis and Samuel Adams; the Boston Massacre; the Boston Tea Party, and the retribution inflicted in the form of the Boston Port bill, inflamed the rest of the colonies. In 1774 a State government and militia were organized. Lexington and Concord followed, and the Revolution received the most enthusiastic, though not undivided, support throughout the commonwealth. (See REVOLUTION, AMERICAN.)

In 1780 the present constitution was adopted, and slavery was abolished; and in 1788 the United States Constitution was ratified. The anti-slavery movement had its birth in Boston, where William Lloyd Garrison first issued the *Liberator* on Jan. 1, 1831. The abolition of slavery from that time onward became a vital factor in the history of the State. During the Civil War Massachusetts furnished nearly 160,000 men to the Union army. Massachusetts suffered extensively from the effects of the New England hurricane of September 1938.

Consult Hale's *Story of Massachusetts*; Bradford's *History of the Plymouth Settlement*; Skelton's *Story of New England* (1910); Hart's *Commonwealth History of Massachusetts* (5 vols., 1928).

Massachusetts, North American Indians, a branch of the extinct Natic nation, who were members of the Algonquin family, and inhabited Eastern Massachusetts, occupying, when the English arrived, the present site of Boston and its vicinity. Prior to the coming of the whites, their strength was estimated at almost 3,000 warriors, but as a result of war with the Tarratine, their implacable en-

emy, and the pestilence of 1617, in which they suffered more than any other tribe, the English colonists found them reduced to a mere handful. In 1631 they numbered only about 500 and a few years later ceased to have a tribal existence, becoming merged with other tribes in villages of converts (Natick, Nonantum, and Ponkapog). Their language survives in the Bible of John Eliot, 'the Apostle of the Indians.'

Massachusetts Bay, a triangular body of water off the eastern Massachusetts coast, extending from Plymouth Bay to Cape Ann (45 m.), with a maximum width (opposite Boston harbor) of 23 m., and a maximum depth of 260 ft. The irregular coast line encloses numerous harbors, including Boston, Salem, and Gloucester.

Massachusetts Institute of Technology, a leading non-sectarian school of applied science, established in Boston in 1861. The Civil War postponed the opening of the School of Industrial Science until 1865, but the Society of Arts was begun in 1862. The buildings of the Institute were formerly situated in the heart of the city of Boston, but in 1916 were rebuilt on a new site in Cambridge bordering on the Charles River basin. A feature of the institution is the number of large and well-equipped laboratories. Women may be admitted to the courses.

Massage, a general term for various movements, made for curative purposes, mostly by the hands of the operator or masseur (feminine, *masseuse*), over the surface of a patient's body, head, or limbs. In recent years it has been widely used in connection with electricity. The general result of massage is to hasten tissue metabolism (the constant process of destruction and repair going on throughout the body), and to equalize the distribution of the blood by facilitating its flow. Massage, introduced from the East, was known to ancient Greek and Roman physicians. It has been in use in England since 1800, though previously practised on the Continent; and it is within the last century that it has been organized into a scientific system.

Massasoit, (c. 1580-1661), famous Indian chief and warrior, was born in the district afterward known as Massachusetts, and was head chief of the Wampanoags, whose lands extended from Cape Cod to Narragansett Bay. Shortly before the landing of the Pilgrim Fathers at Plymouth the tribe had been reduced by an epidemic to three hundred fighting men. Massasoit's messenger, Samo-

set, who had gained knowledge of English from the northern fishermen, appeared at Plymouth in March, 1621, and was shortly followed by the chief himself, who concluded a treaty with the Plymouth authorities, offensive and defensive in character, which was kept by the contracting parties for over fifty years.

Masséna, André, Duc de Rivoli (1758-1817), French marshal, one of Bonaparte's most useful coadjutors. His defence of Genoa was a brilliant achievement. In 1806 he occupied the kingdom of Naples, and in 1807 took part in the war against Russia. In 1808 he was sent to Spain, but in 1809 was recalled to serve against Austria. During the Hundred Days he supported Napoleon, and, as commander of the National Guard, kept order in Paris.

Massenet, Jules Emile Frédéric (1842-1912), French musical composer. In Rome he composed the *Requiem Mass* and the oratorio *Marie Madeleine*. He was known chiefly for his concert music until the operas *Don César de Bazan* (1872), recently revived in Paris) and *La Roi de Lahore* (1877) met with popular favor, and placed him in the front rank of French melodic composers. Among other important works are his oratorios, *La Vierge* (1879); *La Terre Promise* (1900); his operas, *Manon Lescaut* (1884); *Thais* (1894); *Le Jongleur de Notre Dame* (1902); *Cigale* (1904); *Thérèse* (1907); *Bacchus* (1909); *Don Quichotte* (1910); *Roma* (1912). He also published orchestral suites, pieces for the piano, and songs.

Massey, Gerald (1828-1907), English man of letters. He became acquainted with Maurice and Kingsley. He published *Voice of Freedom* and *Lyrics of Love* (1851); *Ballad of Babe Christabel* and *Other Poems* (1854), his most important volume. In 1890 appeared a collected edition of his poems in two volumes, entitled *My Lyrical Life*. Massey had a fine lyric sense. He is said to have been the prototype for George Eliot's *Felix Holt*. Consult Flower's *Gerald Massey*; Collins' *Studies in Poetry and Criticism*.

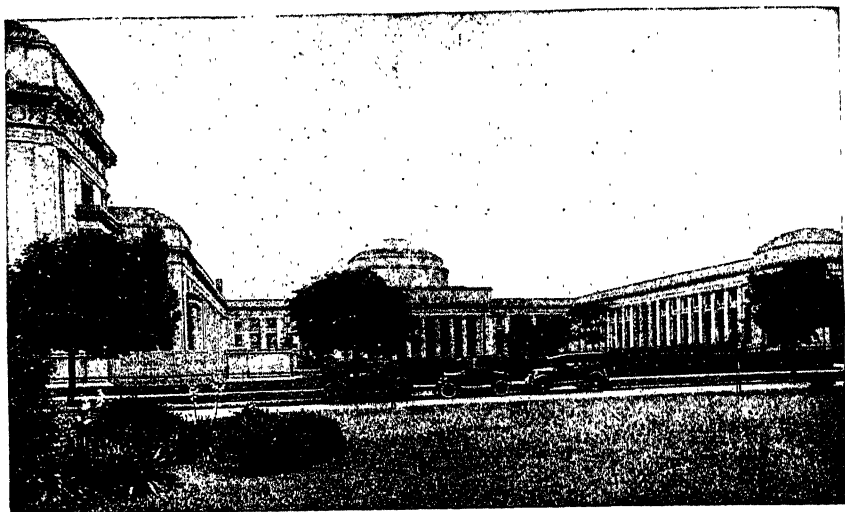
Massey, Vincent (1887-), Canadian statesman, was born in Toronto. He has been President of the National Council of Education and has published books on education and other subjects. He was president of the Massey-Harris Co., resigning to become a member of the McKenzie-King cabinet. In 1926 he was named first Canadian minister to the United States, and retained this post until 1930.

Massillon, city, Ohio, Stark co., on the Tuscarawas River. Deposits of white sandstone, potter's clay, iron, and the well-known Massillon coal are found in the region, and the city is a shipping point for wheat, corn, butter, and wool. Important industries include iron and blast furnaces, car and structural works, and the manufacture of bottles, engines, reapers and threshers, furnaces, pumps, paper, flour, and sash and blinds; p. 26,644.

Masson, **Thomas Lansing** (1866-1934), American humorist and editor. Became telegraph editor, and later managing editor, of the American Press Association; wrote for

standard edition of the Massorah is that of Ginsburg.

Massowah, fortified town and most important port of the Italian colony of Eritrea, on the western shore of the Red Sea, partly on a coral islet. It is connected by rail with Asmara, the capital, and a powerful wireless station furnishes communication with Italy and Italian Somaliland. The climate is intensely hot and humid in summer, the mean average temperature being 88°. The chief industries are the evaporation of salt and cotton ginning, and there are pearl fisheries in the Dahlak archipelago close by; p. 48,270 (360 Europeans.)



Massachusetts Institute of Technology.

the New York *Sun*; was the literary and managing editor of *Life* (1893-1922), and associate editor of the *Saturday Evening Post*. He published *The Yankee Navy* (1899); *Humor of Love in Verse and Prose* (1906); *The Best Stories in the World* (1913); *Short Stories from Life* (1916); *Why I am a Spiritual Vagabond* (1925); *Tom Masson's Annual*; *Ascensions* (1929).

Massorah, the name (with various spellings) given to a body of annotations and signs accumulated by Jewish scholars for the purpose of keeping inviolate the text and interpretation of the Hebrew Old Testament. These commentators drew up rules for the guidance of copyists; made elaborate statistics of verses, words, and letters; noted peculiar forms and various readings, etc. The

Mast, a support for the rigging of a ship, rising perpendicularly from the keel, where it is attached (stepped). It may be fashioned of a single pole of strong wood; several poles fastened by iron bands (forming the lower mast, topmast, topgallant mast, etc.); or, on large vessels, steel plates fitted together to form a hollow cylinder. On warships masts are erected chiefly for signalling purposes. Tops, or mast platforms, long used for fighting, are generally fire-control stations.

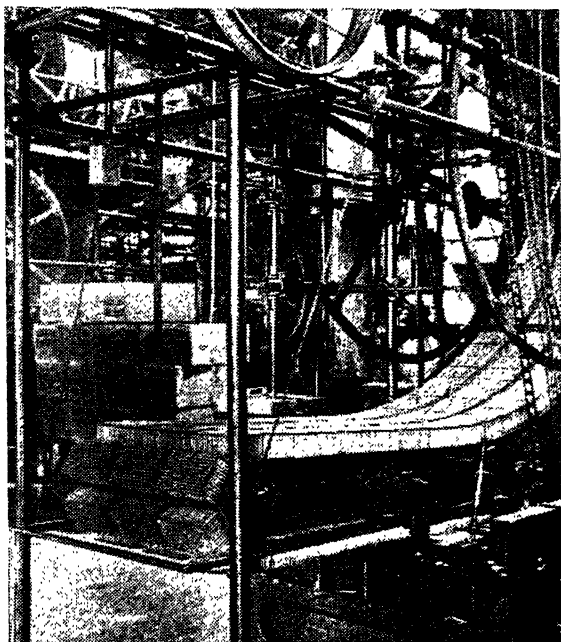
Master in Chancery, a subordinate officer of courts of chancery, appointed by the judge of such a court, to take and state accounts, take testimony, make settlements under deeds, and perform other like duties. The office no longer exists in England, but has generally been retained in the equity courts

of the United States. In some of them, as in the chancery jurisdiction of the Federal courts, masters in chancery are now known as Commissioners.

Masters, Edgar Lee (1869-), American poet, was born at Garnett, Kansas. His most popular work was his *Spoon River Anthology* (1915). Later works are *Domesday Book* (1920); *Poems* (1925); *The Fate of*

possesses remarkable courage and power, derived from the bulldog strain in its composition, and is by nature gentle and docile, though occasionally a savage specimen is met with. The average height is 30 inches, and the weight 120 to 180 lbs. The color is fawn or brindle.

Mastodon, a fossil elephant of somewhat more primitive type than the mammoth.



Machine for Match Manufacture.

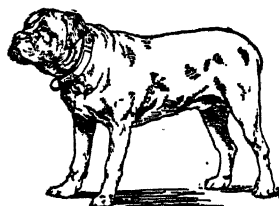
the Jury (1929); *Lincoln—The Man* (1931); *Illinois Poems* (1941).

Mastic, a resin obtained from a shrub, *Pistacia lentiscus*, that grows in Southern Europe. It softens and melts when heated, and is used in the preparation of varnish for prints and maps.

Mastication, the grinding of food into small particles by the teeth, by means of the muscles of the lower jaw. The food is thus prepared for the digestive process by its subdivision into minute particles, and is partially digested by the chemical action of the saliva, the secretions of which are greatly increased by the pressure on the glands.

Mastiff, said to be one of the oldest varieties of dogs, though the old mastiffs differed materially from those of the present day. It

There are several genera, divided according to the number and character of the tusks. The tetrabelodon (four tusks) dates from the Mi-



Mastiff (Beaufort).

ocene period, and ranged over Europe, Asia, Africa, and North America. The dibelodon (two tusks) was a later development (Pleis-

tocene), containing several species found in North and South America, in association with flint instruments. The Warren mastodon skeleton in the New York Museum of Natural History is said to be the finest specimen in the world.

Mastoiditis, inflammation of the mastoid antrum and cells, due to bacteria—commonly an extension of chronic inflammation of the middle ear. Caries of the bone is produced; and if the disease spreads, abscess of the brain, fistulæ of the neck, and other complications may result. Mastoiditis occurs in acute, sub-acute, and chronic forms.

Matabele, a war-like Zulu people of Bantu stock, who under the powerful chief Umsilikatze overran the greater part of the present Transvaal, and established themselves on the Bechuanaland frontier between 1820 and 1828; later withdrawing across the Limpopo to the Matopo Hills (1837). Since the conquest of Matabeleland, they have devoted themselves chiefly to agriculture and stock raising. They also hunt, fashion crude implements from iron, make rough pottery and manufacture cloth from bark. They live in villages, in round houses with conical thatched roofs. Their present number is about 250,000.

Matabeleland, district, Rhodesia, British South Africa, extending some 200 m. n. of the Limpopo River, by which it is separated from the Transvaal Colony. It is bordered on the w. by the Bechuanaland Protectorate, and covers an area of 70,800 sq. m. The soil is fertile, and produces cereals, sugar, and cotton. There are vast forests, and gold and other minerals are abundant. Buluwayo is on the main line of the Cape to Cairo Railway, and is in railway connection with Salisbury in Mashonaland. The districts of Matabeleland and Masbionaland now form Southern Rhodesia.

Matador (Spanish, 'slayer'), the principal actor in the Spanish sport of Bull Fighting.

Matamoros, town, state of Tamaulipas, Mexico, on the Rio Grande; 23 m. from its mouth, and opposite Brownsville, Texas. The principal exports are hides, wool, and cotton seed. Early in the Mexican War the town was occupied (May 18, 1846) by the American forces under General Taylor; p. 12,000.

Matamoros, town, Pueblo state, Mexico, 4,160 ft. above sea level. It has coal mines; p. 7,000.

Matanuska, a river of Alaska, tributary to Knik Arm, Cook Inlet. In its valley, 25 m. from Knik Arm, are the famous Matanuska

coal fields. Into this section the U. S. transplanted, in 1935, about 200 families from the drought-stricken areas of the midwest.

Matanzas, province, Cuba, is bounded on the n. by Florida Channel, on the e. and s. by the province of Santa Clara, and on the w. by the province of Havana. Highlands border the coast, culminating in the Pan de Matanzas, but the greater part of the province is low, especially in the s. The chief rivers are the San Juan, Palma, Yumuri, and Canimar. Sugar cane, oranges, bananas, henequen, and corn are produced. Asphalt and copper are mined. The principal cities are Matanzas, the capital, and Cardenas. Area, 3,700 sq. m.; p. 375,000.

Matanzas, capital of the province of Matanzas, and second largest city in Cuba, on the Bay of Matanzas. It is situated on the southern and eastern sides of a spacious harbor, in an amphitheatre of hills. The city proper, or Old Town, lies between the San Juan and Yumuri Rivers; on the north bank of the Yumuri is Versailles, the residential section; and south of the San Juan is the New Town. The streets are broad and well laid out, and there are a number of beautiful parks and boulevards.

Matanzas is the port of export for the province, its chief shipments being sugar, molasses, and rum; p. 46,000.

Matapan, Cape (ancient *Tænarum*), the southern-most point of Greece, bold and precipitous, between the Gulfs of Laconia and Messenia.

Matches, splinters of wood or other material tipped with some chemical composition inflammable on friction. The first practical match ignitable by simple friction was invented by John Walker, an Englishman, in 1827. The first successful phosphorus matches appeared between 1830 and 1835, and the first patent for the invention of phosphorus friction matches in the United States was granted in 1836 to A. D. Phillips. Modern matches are of wood tipped with an igniting composition containing essentially two chemical substances whose reaction with each other is accompanied by the evolution of heat. The substances are so chosen that the reaction starts of itself at a temperature that can be attained by rubbing the match head on a suitable surface. As the combustion of the igniting composition is usually very sudden, it is found necessary, in order to insure the ignition of wooden match splints, to coat a portion of the wood near the head with some material that will readily yield an in-

flammable vapor when heated. For this sulphur was formerly used (brimstone matches); but now paraffin and stearin are usually employed.

The use of white or yellow phosphorus in match manufacture was found to be attended with serious disadvantages, chief of which is the liability of the operatives who are exposed to its fumes to contract 'phossy jaw,' an affection of the lower jaw beginning at carious teeth and leading to necrosis of the jaw bone. Its use was forbidden in Denmark in 1875, and has since been prohibited in Switzerland, Great Britain, Germany, France, Austria, Netherlands, Luxemburg, Finland, Italy, Spain, and the United States.

Mate is an assistant, a deputy, or a second in any work. The term, however, is usually applied to the officer in a merchant ship, who assists the captain. There are three grades. The first mate commands the port watch and keeps the logbook, besides generally superintending all matters regarding the management of the vessel. The second mate commands the starboard watch, and manages the vessel when his superior officers are below. The third mate is usually charged with the care of the stores, but he also helps in working the ship, and when required has to perform the duties of an ordinary seaman. In some large vessels there is a fourth grade of mate. In the U. S. Navy, *gunner's mate*, *boatswain's mate*, etc., are classed as petty officers.

Materialism, a term for any theory which holds matter self-actuated, in distinction from controlled from within or without by a Divine Being. Democritus of Abdera held that all existence is a stream of atoms, the senses receiving them as rough patterns of the objects. A line of successors adopted the theory, including the Epicureans and Stoics. Having neither God, soul, nor ethics, it would seem anathema to Christian thinkers; but Tertullian took it over, giving both God and soul a material body. With the 17th and 18th centuries many thinkers and scientists placed materialism on a scientific footing it has never lost. Of late there is a reaction toward the old belief in independent spiritual being.

Materia Medica is that department of the science of medicine, belonging partly to pharmacology, partly to therapeutics, which treats of the materials employed for the alleviation and cure of disease, their properties, physiological actions, and uses.

Maté Tea, or **Paraguay Tea**, a beverage

prepared from various species of holly native to South America, especially *Ilex paraguayensis*, the Maté Plant. The leaves are collected by the natives either from wild or cultivated plants; they are dried upon racks for twenty hours by a slow fire, and are then ground or crushed. It is extensively used throughout South America, and almost universally in Brazil.

Mathematical Instruments, a term including all instruments in use for drawing and measuring lines, areas, and angles, and for the solution of equations. The straight-edge and the compasses are the only tools allowed in the construction of any figure in Euclidian geometry. For ease in comparing lengths, or in measuring off given lengths, a divided rule or scale is used. Moreover, in many problems of practical geometry, and especially in architectural, perspective, and mechanical drawing, an instrument for measuring off definite angles is absolutely necessary. Such an instrument is the protractor. It has various forms, but the most convenient is the semicircular or quadrantal. The rim is graduated in degrees or half-degrees, and the centre is indicated in such a way that it can be readily set at the point at which the angle is to be drawn.

To facilitate linear measurements, scales are divided in a great variety of ways. *Gunter's scale* is divided according to the logarithms of the natural numbers. This scale has developed within recent times into the *slide rule*, of the mechanic and engineer.

Mathematics. It is difficult to give a definition of mathematics which is at once brief, intelligible, and comprehensive. The older definitions which called mathematics the science of number and space are no longer comprehensive, for they do not include many branches of modern mathematics—for example, the theory of abstract groups and projective geometry. In modern times one definition states that mathematics is the science which draws necessary conclusions. Not only does this definition include much that is not called mathematics, but it excludes much that is usually so classed. According to another, mathematics is the science concerned with the logical deduction of consequences from the general premises of all reasoning. Mathematics has been classified as Pure Mathematics and Applied Mathematics; and these two are divided and subdivided into many different subjects. The following classification is in the main an abridgment of the one found in

the great French Mathematical Encyclopædia. PURE MATHEMATICS. I. ALGEBRA. 1. Arithmetic. 2. Algebra. 3. Theory of Numbers. 4. Theory of Probabilities. II. ANALYSIS. 1. Functions of a Real Variable. 2. Functions of a Complex Variable. 3. Differential Equations. 4. Development in Series. 5. Calculus of Variations. 6. General Analysis. 7. Functional Equations. III. GEOMETRY. 1. Pure Geometry. 2. Descriptive Geometry. 3. Elementary Geometry. 4. Analytic Geometry. 5. Differential Geometry.

APPLIED MATHEMATICS. I. MECHANICS. 1. Vector analysis (Quaternions). 2. Kinematics. 3. Kinetics. 4. Statics. 5. Ballistics. 6. Hydrodynamics. 7. Elasticity. II. PHYSICS. 1. Thermodynamics. 2. Molecular physics. 3. Electricity. 4. Electron Theory. 5. Optics. III. GEODESY GEOPHYSICS. 1. Navigation. 2. Geodetic mensuration. 3. Cartography. 4. Magnetism. 5. Meteorology. IV. ASTRONOMY.

The history of mathematics falls naturally into three periods. To the first period belong those mathematical developments which preceded the founding of the universities of Central and Western Europe, about the 13th century. The second period extends from the opening of these universities to the establishment of permanent mathematical periodicals, about the beginning of the 19th century. The third period includes all the developments made from the founding of these periodicals to the present time.

The written records of the history of mathematics date back to about 1700 B.C. With the establishment of the Ionian school of Thales, about 600 B.C., the history of geometry as a science began, and developed for some 300 years to the time of the great Alexandrian School, which produced Euclid, Archimedes and Apollonius. Then followed many centuries with little progress. Our present number system started among the Hindus, and was transmitted through the Arabs to Europe.

The second period was one of great progress. During this time the first printed works on mathematics appeared, among them an edition of Euclid in 1482. In the 16th century Tartaglia, Ferro, and Ferrari in Italy, and Vieta in France, developed algebra to such a point that it needed only the later work of Descartes to bring it to its present state. Pure geometry was developed by Kepler, Desargues, and Pascal, the theory of numbers by Fermat, and logar-

ithms were invented by Napier. But the two most far-reaching discoveries of this period were analytic geometry by Descartes and differential and integral calculus by Newton and Leibniz.

The third is the greatest period in the history of mathematics, and it is probably just beginning. During this time, not only have the older branches of mathematics steadily grown, but many new ones have appeared, and taken their places as important branches of the science. To get an idea of the great growth of mathematics in this period, one need only mention some of the important branches which were unknown at the beginning of the 19th century: differential geometry, projective geometry, non-Euclidean geometry, *mengenlehre*, vector analysis, functional equations, automorphic functions. As science in general develops it becomes more exact and susceptible of mathematical treatment, and gives rise to the various topics classed as applied mathematics. The last century has witnessed remarkable advances in this division of mathematics. Two examples may be mentioned: Lord Kelvin's work in connection with the laying of the first Atlantic cable, and Pupin's work in long distance telephony. Any large modern steel bridge is an object lesson in the application of mathematics to engineering. In connection with this article see the various mathematical articles in this work.

Mather, Cotton (1663-1728), third and last of note of the famous Mather family in New England, the son of Increase Mather, was born in Boston; the best known name in English America before the Revolution, and until the time of Benjamin Franklin and Jonathan Edwards. A precocious, bookish boy, largely taught by his father, he was early proficient in classics, Hebrew, and church history. He was called to the Second Church as his father's assistant, and in 1685 was ordained pastor, Increase being 'teacher.' This partnership lasted for nearly 40 years. Cotton Mather's reading and memory were vast on any scale; his scholarship was the pride and awe of New England, and had notable influence. He knew fairly seven languages. His wide reading led him to go deeply into the subject of Witchcraft, the first signs of which appeared in Salem in 1692. His name is connected with the Witchcraft trials, on which he also wrote voluminously.

Cotton Mather was the chief scholar and writer of America's first century. The best

known and most typical of his works is the *Magnalia Christi Americana, or the Ecclesiastical History of New England*.

Mather, Frank Jewitt, Jr. (1868), American art critic and educator, was born in Deep River, Conn. He has been assistant editor of *The Nation* (1901-06); art critic of the *New York Evening Post* (1905-06, 1910-11); American editor of *The Burlington Magazine* (1904-06); and Marquand professor of art and archæology at Princeton University (since 1910). He has written *Homer Martin, Poet in Landscape* (1912); *The Collectors* (1912); *Estimates in Art* (1916). Later works include *Modern Printing* (1927). Since 1933, director of University Art Museum.

Mather, Increase (1639-1723), second and greatest of the famous Mather family, the youngest son of Richard Mather, was born in Dorchester, Mass. He was graduated from Harvard in 1656; visited his brothers in England and Ireland; in 1658 took the degree of M.A. at Trinity College, Dublin, and became a Nonconformist minister. But the Restoration government demanded conformity; in June, 1661, he returned to Massachusetts; preached at the newly gathered Second or Old North Church in Boston; became its pastor in 1664; and remained such till death, close on 60 years—latterly with his son Cotton Mather as colleague. He put the whole force of a strong intellect, a dominating personality, and concentrated will, into maintaining the Puritan ideal that created Massachusetts. In 1684 the colony's charter was vacated, and in 1688 Mather was sent to England to regain the charter. Mather's skill of diplomacy secured not only a new charter very favorable to colonial liberty but for royal governor his and the church's choice, Sir William Phips, who named every member of his council of 28 on Mather's suggestion.

When Increase Mather and Phips arrived in New England in May, 1692, they were met by the Salem terrors and clamors (see *WITCHCRAFT, Salem Witchcraft*); and Mather must have favored the extra-legal special court which made such panic slaughter. Increase Mather's long presidency of Harvard marked a losing fight for sectarian control. Appointed in 1681, he was a valuable head, more than doubling the size of classes; and while in England secured benefactions. His published works include: *A Brief History of the War with the Indians in New England* (1676, ed. by Drake, 1862);

An Essay for the Recording of Illustrious Providences (1684), commonly called *Remarkable Providences*.

Mather, Richard (1596-1669), founder of New England's greatest clerical dynasty, was born in Lancashire, England. As Archbishop Laud's rule had begun, and he had been twice suspended for nonconformity, in despair he emigrated to Boston, and gathered a church at Dorchester. He soon became a leader. In 1640 he joined Thomas Welde and John Eliot in compiling the *Bay Psalm Book*, the first book printed in the English colonies; and wrote the preface. In 1643 he drew up the *Answer of the Elders of . . . New England to Two and Thirty Questions* [from] *Ministers in England*, giving the Congregational view of church polity and in the synod of 1648 formulated the famous Cambridge platform of church order.

Mathews, Shailer (1863-1941), American educator, born in Portland, Me. He has been professor and dean of the Divinity School of the University of Chicago. From 1912-1916 he was president of the Federal Council of the Churches of Christ in America. His published works include: *The Social Teaching of Jesus* (1897); *The Social Gospel* (1909); *The Spiritual Interpretation of History* (1916); *The Student's Gospels* (1927); *The Atonement and the Social Process* (1930). He has been editor of *The World To-Day*, and of *The Biblical World*.

Matins, one of the canonical hours of the Breviary. In the Roman Catholic Church the divine office for the day begins with matins and lauds, which form the longest of the seven hours. Anglican matins, or morning prayer, combine late forms of matins, lauds, and prime. Originally matins used to be said in the early morning; but in the 18th century it became customary to say the office at 11 o'clock.

Matisse, Henri (1869), French painter and sculptor, one of the leading exponents of Post Impressionism, was born in Cateau. He studied at the Ecole des Beaux Arts, Paris. Coming under the influence of Cezanne, about 1899, he discarded the accepted standards of beauty in favor of a more primitive art having for its chief aim the expression of the artist himself. He is an excellent draftsman, his work is permeated with energy, and his color sense is profound; but his revolt against the conventional has brought upon him accusations of grotesqueness and insincerity. Among his best-known works

are a portrait of himself, *The Woman with the Green Eyes*, *Young Sailor*, *Dance* and *Music*.

Matlock, watering place, Derbyshire, England, on the Derwent. Toward the end of the seventeenth century the waters of the Matlock Bath began to be used medicinally. The warm springs are used in the treatment of rheumatic, cutaneous, and other affections. There are famous stalactite caverns and some petrifying wells; p. 10,600.

Matsukata, Masayoshi, Prince (1835-1924), Japanese statesman, was born in Satsuma. He visited Europe in 1878, and studied finance. In 1881 he became Minister of Finance of Japan and by his energy and wisdom did much to restore his country's credit, which had been impaired. In 1897 a gold standard was adopted on his recommendation. He was again Minister of Finance in 1898-1900.

Matsumoto, town, Japan, on the island of Hondo. It has an old Daimio castle. Silk weaving and basket and bamboo box making are the leading industries; p. 63,427.

Matsushima, village, Japan, on the Bay of Sendai, on the eastern coast of Hondo. Its shallow lagoon, studded with over eight hundred wooded islets, is wonderfully picturesque and forms one of the 'three natural wonders' of the Japanese coast.

Matsys, Quentin (1466-1530), Dutch painter, was born in Louvain. He painted many religious pictures, portraits, and genre subjects, and his style may be regarded as intermediate between that of Van Eyck and the realistic Dutch school. His *Adoration of the Kings* is in the Metropolitan Museum, New York City.

Matter, in physics, is one of the indefinables of the universe. What we are directly conscious of in our experience are certain sensations, which we believe correspond to certain material changes in the world outside of us. Not only, according to our belief, is there change in the world external to us, but there is physiological change in the substance we call our brain. Behind these changes we postulate a permanent something whose essence remains unchanged, however much the relative configuration of its parts may alter; and this something we call matter. The limitations of our senses should warn us against the assumption that matter has ultimately any real resemblance to what we conceive it to be. Indeed, many of the characteristics by which we recognize different kinds of matter do not, strictly speaking, belong to

matter. Such, for example, is color, which depends upon the nature of the illuminating light. Moreover, the progress of physical science has brought to our knowledge properties of matter which have no effect upon our organs of sense—electrical and magnetic properties. Had we an organ of perception sensitive to differences of electrical potential, our outlook on the world of phenomena would be fundamentally altered. These considerations show that all theories as to the ultimate constitution of matter cannot be other than purely speculative.

There is, however, a general consensus as to certain ultimate characteristics of matter. There is first the permanency or conservation of matter, the principle which lies at the root of all chemical work and theory. Then there is the notion that the ultimate parts of matter are impenetrable; no two portions can occupy the same space at the same time. It has been argued, however, that atoms may not prove to be mutually impenetrable. Another general property is inertia. Finally, there is the accepted modern view of the structure of matter as molecular, atomic, and sub-atomic, which conceives matter in terms of phenomena, electrical and otherwise, with the atom no longer an unbroken entity but an infinitesimal revolving "universe" with nucleus, proton, and electron as its apparent units. The entire theory of the structure of matter began to change with the discoveries of the Curies and their successors as to radio-activity. Summaries of these studies under *ATOM*, *ELECTRON*, etc. in these volumes give a suggestion of the new and constantly developing knowledge which translates physical phenomena in terms of electricity and electrical phenomena in terms of matter; but while all this hypothetical study of the essence of matter continues, the practical treatment of matter according to the molecular and kinetic theories continues. For convenience, an important branch of natural philosophy is called the properties of matter, including such subjects as color, gravitation, elasticity, inertia, mass, transparency, etc. See *PHYSICS*.

Matter, in philosophy, has two main usages. In the first and more general use, it is opposed to form; while in the second or more specific, matter is opposed to mind or spirit, the material world to the psychical or spiritual. The distinction of matter and mind became, through Descartes, a fundamental problem of modern philosophy. Not only did Descartes raise the more abstract philo-

sophical problem of the relation of mind to the external world, but he is also entitled to be regarded as one of the principal founders of that mechanical view of the material world at which modern science has been steadily working since his time. The French philosopher Bergson maintains that matter is what we see and touch or perceive.

Matterhorn, an Alpine summit of the Pennine group (14,781 ft.) rising just s.w. of Zermatt, between the Val d'Aosta in Italy and the canton of Valais, Switzerland.

Matthew, one of the twelve apostles of Jesus, was the son of Alphaeus. He was a publican living near Capernaum and was one of those charged with the collection of taxes. He was early called a disciple of Jesus and left all to follow him, making a farewell feast at which his former friends and business associates were present. There is no record of his activities as a disciple but his name has always been associated with the first Gospel.

Matthew, The Gospel, According to, the first book of the New Testament. It pre-eminently represents Jesus as the Messiah, the fulfiller of God's promises to Israel, and the descendant of David and Abraham. The date of composition is usually reckoned to be about 70 A.D. See GOSPELS.

Matthews, (James) Brander (1852-1929), American writer and educator, was born in New Orleans. He was graduated from Columbia College in 1871, and was appointed professor of literature at the same institution in 1892. In 1900 he exchanged the chair of literature for that of dramatic literature, which he retained until his retirement in 1924. He took part in the movement in 1906 for 'simplified spelling,' and was chairman of a board voluntarily organized to advance that cause. In 1922-4 he was chancellor of the American Academy of Arts and Letters and was president of the National Institute of Arts and Letters (1913-14). He edited several works relating to the stage and published various books on literary subjects, such as *The Philosophy of the Short Story* (1901), *Molière* (1910), *Shakespeare as a Playwright* (1913), *The Oxford Book of American Essays* (1914).

Matthews, John (1836-1905), American actor, was born in England. He was for many years a member of A. M. Palmer's stock company at the Union Square Theater in New York. He was a member of Laura Keane's company, presenting *Our American Cousin*, at Ford's Theater on the night of

the assassination of Lincoln. He was arrested for complicity, but was soon proved innocent.

Matthias Corvinus (1440-90), king of Hungary, the second son of John Hunyadi, was born at Klausenburg, and was chosen king in 1458. From 1478 to his death he was in almost continual opposition to the Emperor Frederick III. In 1485 he occupied Vienna, and in 1487 invaded Lower Austria. He was a great patron of arts and letters, collected a large library at Budapest, founded a university there, issued a law code, and effected many useful social reforms.

Matthison, Edith Wynne (1875-), American actress, born in Birmingham, England, made her first appearance in musical comedy (1896) and was a member of Ben Greet's company, 1897-1903. In 1898 she was married to Charles Rann Kennedy, the dramatist. She distinguished herself in Greek plays, mysteries, old English comedies, and was especially successful in Shakespearean plays with Sir Henry Irving and Sir Herbert Beerbohm Tree, and in modern plays such as *The Blue Bird*, *The Piper*, *Sister Beatrice* and *The Arrow-maker*. In 1919 she became head of the drama department of the Bennett School of Liberal and Applied Arts at Millbrook, N. Y., appearing in the School's annual Greek plays. In 1930 she made a great success as Hamlet. In 1932 she toured with her own company in her husband's plays.

Matting, a rough-woven or plaited fibrous material used for floor or furniture covering, for wrapping merchandise, for hangings, and for other purposes. It is manufactured from the inner bark or leaves of palms, and from rushes, straw, grass, rattans, and bamboos. Matting is made for native use and for export in India and the Far East. The floor mats are usually woven from rushes, and the weaving is done in a very primitive fashion. European mattings are made from reeds and rushes and are largely produced in Spain, Portugal, and Great Britain. American matting is made from wire grass (*Carex filiformis*), reeds, coir, rubber, and steel wire. Wire grass (native) is dried by machinery and woven into matting with a cotton warp. Coir matting is made from the husk of the cocoanut palm. The natives of the Philippine Islands manufacture mats from a fibrous leaf of the nipa palm.

Matto Grosso, Brazilian state, occupies nearly half the total width and length of Brazil, extending from Bolivia on the w. to

the river Araguay on the e. The area is variously stated (532,210 sq. m. and 637,000 sq. m.). The northern part is plateau, the southern part low and swampy. Mountain ranges break the surface. Gold, silver, platinum, lead, and diamonds await production. Cuyabá is the world's ipecac city. Maté, coffee, sugar, rice, tobacco, oranges, mangoes, and other fruits, rubber hides and carnauba wax are produced; p. about 350,000, mainly Indians and blacks. The capital and largest city is Cayubá; p. about 15,000.

Matzenauer, Margarete (1881-), operatic mezzo-soprano, was born in Temesvar, Hungary. In 1911 she made her first appearance in the Metropolitan Opera House, New York City, where she became one of the leading prima donnas. In 1918 she became an American citizen.

Maubeuge, fortified town, France, department of Nord, is situated on the Sambre River, 14 m. s. of Mons, Belgium. It has foundries and other manufactures. It was besieged by the Germans in August, 1914, during the Allied retreat from Mons and the Sambre, and fell on Sept. 7; p. 24,221.

Mauch Chunk, borough, Pennsylvania, county seat of Carbon co., on the Lehigh River, 28 m. s.e. of Wilkes-Barre, and 89 m. from Philadelphia. It is noted for its salubrious climate and for the beauty of the surrounding country. It is also an important railroad center, and is the shipping point for a productive coal region. Mauch Chunk was settled in 1806; p. 3,206.

Maude, Cyril Francis (1862-), English actor, made his *début* in Denver, Colorado, in *East Lynne* (1883). He played in various theaters in London for the next ten years, and was the leading comedy actor of his day. He was very successful in *Grumpy*, *Peer Gynt*, *French As She is Spoke*, *The Critic*, and *The School for Scandal*. He appeared in films after 1913. He was author of *The Actor in Room 931* (novel, 1925); *Behind the Scenes with Cyril Maude* (1927).

Maude, Sir Frederick Stanley (1864-1917), British soldier, commander-in-chief in Mesopotamia during the World War. On Aug. 28, 1916, he was placed in command of the Mesopotamian army after General Townshend's surrender at Kut-el-Amara. In command of a force of 150,000, he began his advance toward that city on Dec. 13, 1916, and on February 26, 1917, captured it. He seized Bagdad on March 11, and on Sept. 29 fell upon the army of Ahmed Bey at Ramadie, capturing the town with a great num-

ber of prisoners and valuable stores of ammunition and supplies.

Maugham, William Somerset (1874-), British author, began his literary career after studies at Heidelberg and St. Thomas Hospital. Abandoning a medical career, he attained world recognition in 1915 with his semi-autobiographical novel, *Of Human Bondage*. Other successful works followed in swift succession. *Of Human Bondage* has been filmed and his short story of *Sadie Thompson* was the basis for the play which ran several years under the title *Rain*. Other works include *The Moon and Sixpence* (1919), *Cakes and Ale* (1930) and *First Person Singular* (1931).

Maui, one of the Hawaiian Islands, 26 m. n.w. of Hawaii, from which it is separated by Alenuihaha Channel. The island has large sugar plantations and some coffee lands. Wailuku is the largest city and county seat. Area 728 sq. m.; p. 56,146.

Maumee River, formed at Fort Wayne, Ind., by the junction of the St. Joseph and St. Mary Rivers, flows n.e. into Ohio, and continues in the same direction to the w. end of Lake Erie, where it empties into Maumee Bay. Length 150 m. Toledo, Defiance, Napoleon and Fort Wayne are the chief towns on its banks.

Mauna Kea, extinct volcano in center of Hawaii, the highest mountain in Polynesia (13,825 ft.)

Mauna Loa, an active volcano, on the island of Hawaii. Eruptions occurred in 1855, 1868, 1880, 1887, 1899, 1907, 1914, 1916, 1919 and 1926. In 1916 it became a part of Hawaiian National Park together with Kilauea.

Maundy Money, the name given to small silver coins (specially struck for the purpose) given to poor persons in London on Maundy Thursday. For the first time in 220 years, the King in person distributed them on March 24, 1932.

Maundy Thursday, the Thursday before Easter. The day commemorates the Last Supper, and the washing of the disciples' feet, the name being a corruption of the Latin *Mandatum* ('commandment'), with reference to John xiii. 34, 'A new commandment give I unto you. . . .'

Maunoury, Michel Joseph (1847-1923), French general. He was famous in the World War as commander of the secretly-assembled 6th French Army, which, emerging from Paris, attacked the German flank in the first battle of the Marne (Sept. 1914). This

maneuver isolated von Kluck's I. Army, forced the German retreat and decided the battle.

Maupassant, Henri René Albert Guy de (1850-93), known generally as Guy de Maupassant, French author, was born at the castle of Miromesnil, Seine-Inférieure. His first successful short story *Boule de Suif* appeared in *Soirées de Médan*, a collection of tales by Zola and others. Flaubert's death in 1880 removed a moderating influence, and Maupassant began publishing short *nouvelles* at an astounding rate. His constitution was gradually undermined by overwork and dissipation, and in 1893 he died a lunatic at Auteuil. Maupassant made a distinct art of the writing of the short story. He was an extreme type of the naturalistic school, and was possessed of remarkable powers of observation and of character analysis. Volumes of his short stories include: *La Maison Tellier* (1882); *Mademoiselle Fifi* (1882); *Miss Harriet* (1884); *Yvette* (1885); *Contes du Jour et de la Nuit* (1885); *M. Parent* (1886); *Le Horla* (1887). His most important novels are: *Une Vie* (1883); *Pierre et Jean* (1888); *Fort comme la Mort* (1889); *Notre Cœur* (1890).

Maupertuis, Pierre Louis Moreau de (1698-1759), French mathematician. He was one of the first in France to champion Newton's views, and was elected a member of the Royal Society of London in 1728. On the invitation of Frederick the Great he settled in Berlin, and was made president of the Academy of Sciences. His *Œuvres* appeared at Paris in 1752 and at Lyons in 1768.

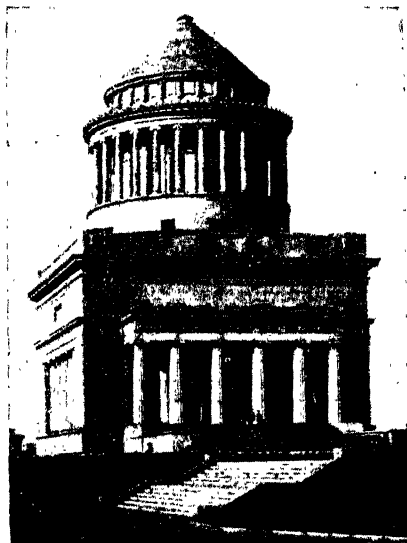
Maurel, Victor (1848-1923), French baritone, first appeared in opera in Paris (1868). He sang in all the great cities of Europe and America and was very successful in *Hamlet*, *Aida*, and *Faust*.

Maurepas, Jean Frédéric Phélippeaux, Count de (1701-81), French statesman, born at Versailles. He was made chief minister by Louis xvi. His policy was anti-British, and he furthered the alliance of France with the American colonies in the Revolutionary War. Consult his *Mémoires* (4 vols. 1792).

Maurice, Sir Frederick Barton (1871-), British soldier, son of a general, received his commission in 1892 and became major-general in 1916. After the Allied disasters early in 1918 he committed a 'breach of discipline' by publicly condemning the Government's policy of keeping troops at home that were needed on the Western Front. That

ended a brilliant military career. In 1922 he became principal of Working Men's College in London. His outstanding works: *Forty Days in 1914*; *The Last Four Months*; *Robert E. Lee, the Soldier*.

Maurists, Congregation of St. Maur, a reformed Benedictine congregation in France, which originated in 1618 and numbered, when dissolved by the Revolution (1792), nearly 200 homes, divided into six provinces. In a time when the French monasteries and clergy had sunk low morally and intellectually, the Maurists distinguished themselves by their simple and upright lives and devotion to scholarly pursuits. The congregation was revived at the Abbey of Solesmes in 1837. Mabillon, Montfaucon, Martène, Bouquet, Ruinart, and d'Achery are some of the great names of the original Maurists, and of the new congregation Cardinal Pitra (d. 1889) has been the most distinguished member.



Mausoleum.

Tomb of General Grant, New York City.

Mauritius, British island in Indian Ocean, 550 m. e. of Madagascar, formerly known as Isle of France. Its coasts are for the most part low, and surrounded by coral reefs. Area 716 sq. m. Formerly large wingless birds, such as the dodo and the aphanapteryx, and huge tortoises were numerous. Lying within the tropics, the island is damp and cyclones are frequent. Staple exports are sugar, copra and poonac, aloe fibre and rum.

Rice, pineapples, vanilla, honey, tea, coconuts and tobacco are produced. The capital is Port Louis. Mauritius is the scene of Bernadin St. Pierre's *Paul and Virginie*; p. 393-323 (268,469 Indians).

Maurois, André (1881-), pseudonym of Emile Herzog, French biographer, novelist, and essayist, born at Elbeuf, educated at Rouen, and served in the World War. His best known works are biographies such as *Ariel ou la Vie de Shelley* (1923); *Lord Byron* (1925); *Disraëli* (1927); *Tourguéniev* (1931); *Lyautey* (1931); *Voltaire* (1932); *King Edward and His Times* (1933); *Autobiography* (1942).

Maurras, Charles (1868-1939), French writer, politician and royalist. With Jean Moréas and others he founded the *école romane*. Among his works are *Trois idées politiques* (1898); *L'avenir de l'intelligence* (1905); *La politique religieuse* (1912); *Dictionnaire politique et critique* (1932-33); *Heures immortelles, 1914-19* (1932).

Mausoleum, a sepulchral monument containing a receptacle for the dead, derives its name from a famous building, one of the seven wonders of the ancient world, erected (353 B.C.) at Halicarnassus by Artemisia, in honor of her husband Mausolus, king (377-353 B.C.) of Caria, Asia Minor. Other famous mausoleums are those of Augustus (28 B.C.), of Adrian (now of the Castle of San Angelo), and of Cecilia Metella, on the Appian Way, at Rome; of the Bourbons at Dreux; of Queen Victoria and Prince Consort at Frogmore, near Windsor; of the House of Hanover at Herrenhausen, near Hanover; of Frederick William III. at Charlottenburg; of Napoleon III. at Farnborough in Kent; and many in the United States, including Grant's Tomb in New York city and that of the Unknown Soldier.

Mauve, or Perkin's Violet, the first aniline dye of commercial value. It is obtained by the oxidation of crude aniline by bichrome and sulphuric acid.

Maverick, a term applied in the West to cattle found starving, which may be branded and claimed by the finder. The name is derived from Samuel Maverick, a Texan, who appropriated a good many head found straying at the end of the Civil War.

Maxillaria, a genus of tropical American terrestrial orchids, with slender coriaceous leaves, and mostly small flowers borne on one-flowered peduncles. They are easy of culture, liking soil of sphagnum and fibrous peat.

Maxim, Sir Hiram Stevens (1840-1916), inventor, was born at Sangerville, Me. In 1888 a company was formed in London to buy the Maxim and Nordenfeldt quick-firing gun patents, and Maxim was engaged as managing engineer. In 1897 this company was merged with the Vickers & Sons Arms Company under the name of Vickers, Sons, and Maxim. It is now one of the greatest arms factories in the world. During the South African War Maxim devoted much



Hiram Maxim.

attention to the manufacture of high explosives, and covered his inventions by many patents. In recent years he devoted a considerable amount of study to the construction of internal-combustion engines, automobiles, and flying machines. His experiments on the physics of aerial flight, carried on over a period of about eight years, are very valuable. In 1901 he was knighted in recognition of his services to the British nation.

Maxim, Hudson (1853-1927), American inventor, brother of Sir Hiram S. Maxim, born at Orneville, Me. He succeeded in producing the first smokeless powder in the United States and sold his rights to the government. In 1890 he founded the town of Maxim, in N. J., and established an explosives factory there. In 1901 he perfected a new explosive capable of fracturing the heaviest armor plate, which he patented under the name of 'Maximite.' The U. S. government bought the manufacturing rights for this explosive. He studied torpedoing, inventing the Hudson Maxim automobile torpedo.

Maxima and Minima. A function $f(x)$ is defined to be a maximum when $x=a$, if $f(a)$ is algebraically greater than $f(x)$, when x is nearly equal to a , but either greater or

less than a ; a minimum, if $f(a)$ is algebraically less than $f(x)$, when x is nearly equal to a , but either greater or less than a . $f(a)$ denotes the value of $f(x)$ when $x=a$. Maximum and minimum values as thus defined must not be confused with the greatest and least values that the function can take for any value of the x ; there may be several maxima and minima, and a maximum may be less than a minimum. For maxima and minima of functions of more than one variable, see Genocchi-Peano's *Differential and Inferential Rechnung* (Ger. trans. 1899).

Maximianus. (1) MARCUS AURELIUS VALERIUS MAXIMIANUS, Roman emperor from 286 to 305 A.D., was a Pannonian by birth, and originally a private soldier, but was made by Diocletian his colleague in the empire. From 306 to 312 he was more or less associated with Constantine, but was put to death for plotting against him (312). (2.) GALERIUS VALERIUS MAXIMIANUS, usually known as Galerius, Roman emperor from 305 to 311 A.D. He was a native of Dacia, originally a shepherd; fought in the wars of Aurelius and Probus, and in 292 A.D. was made Cæsar by Diocletian. He was merciless in his persecution of the Christians.

Maximilian (1832-67), emperor of Mexico, was born (Ferdinand Maximilian Joseph) in Vienna. He was the second son of the archduke Francis Charles, and the brother of the Emperor Francis Joseph I. In 1863, the French having intervened in Mexico, and the U. S. government being occupied with the Civil War, Maximilian, at the instance of Napoleon III., was nominated by Gutierrez-Estrada for emperor of Mexico. He inaugurated a mild reign, and received the submission of some of the Indian leaders, but a large proportion of the Mexicans, headed by Juarez, opposed the new order, and civil war ensued. After the close of the Civil War in the United States, the government of the latter country, which had refused to recognize Maximilian, brought strong pressure to bear on Napoleon, who announced to Maximilian the impending withdrawal of the French troops. The last of them left Mexico in Feb., 1867, and Maximilian, who had previously declined to abdicate and leave his friends in the lurch, was captured at Querétaro by Republican troops on May 14. Maximilian was condemned by the council of war and shot on June 19, 1867.

Maximilian I. (1459-1519), German emperor, was the son of Frederick III., and was born at Neustadt, near Vienna. His fame

is principally due to his efforts to reform the imperial and Austrian administrations. He was an accomplished knight, and was very popular with the citizen classes. See Seton-Watson's *Maximilian I.* (1901), and Lodge's *Close of the Middle Ages*.

Maximilian II. (1527-76), German emperor, the son of Ferdinand I., was born at Vienna, and succeeded to the throne in 1564. His reign was peaceful and uneventful, except that he kept the Turks in check in Hungary (1566-8). See *Life*, by Holtzmann (1903).

Maximinus, whose full name was Gaius Julius Verus, Roman emperor from 235 to 238 A.D. His enormous stature (more than eight feet) and strength attracted the attention of Septimius Severus, who made him one of his own guards. Finally he secured his own election to the imperial throne, and carried on a successful campaign against the Germans.

Maxims, Legal. Epigrammatic statements of certain legal principles and rules which have come into common use, and are sometimes referred to by judges in writing opinions. Most of the doctrines of equity jurisprudence have been the subject of maxims, which are convenient methods of referring to a doctrine, but which do not fully state rules and exceptions.

Maximus, Magnus Clemens, Roman emperor from 383 to 388 A.D., was a Spaniard by birth, and an officer of Theodosius the Great, whom he accompanied to Britain in 368; he was proclaimed emperor by the troops there.

Maximus, Petronius, Roman emperor for less than three months in 455 A.D. A high official of Roman birth, he slew Valentinian III. and ascended the throne, but was killed in the Vandal capture of Rome.

Maximus, Tyrannus, Roman emperor from 408 to 411 A.D., was only the tool of Gerontius, after whose defeat at Arles in 411 he was deposed by Constantine. He was executed in 422 for raising a revolt in Spain.

Max-Müller, Friedrich (1823-1900), English Orientalist and philologist, was born at Dessau in Germany, and was the son of the poet Wilhelm Müller. In 1868 the new chair of comparative philology at Oxford University, England, was created for him, and he held it until 1875. He was Gifford lecturer in natural religion at Glasgow University (1889-93).

Max O'Rell, the pen-name of Paul Blouet (1848-1903), French man of letters, was

born in Brittany. During the years 1887-90 he lectured with success in the United States and published *A Frenchman in America* (1891). Latterly he acted as correspondent for the *New York Journal* in Paris.

Maxwell, James Clerk (1831-79), Scottish physicist, was born in Edinburgh. It may be doubted whether any one has done more for the advancement of modern physics than Maxwell; for not only did he possess great powers of manipulation, and of attacking questions physically, but he also had the ability to analyze and extend them mathematically, with an effectiveness that has been rarely equalled. His principal researches



Friedrich Max-Müller.

(Photo by Elliott & Fry.)

were into the composition and vision of color, the kinetic theory of gases, and electricity, in which, by theory of molecular vortices, he connected the phenomena of electricity and magnetism, and proved the oneness of the disturbances of the ether caused electrically and by light—a deduction that has since been practically demonstrated by the experiments of Hertz and others.

Maxwell, William Henry (1852-1920), American educator, born in co. Tyrone, Ireland, and graduated (1872) at Queen's University, Ireland. Removing to New York city, he entered journalism, and was engaged on the *N. Y. Tribune* and *Herald*, and subsequently managing editor of the *Brooklyn Times*. In 1898 he was made superintendent of public schools for Greater New York.

May, Cape, the s. extremity of New Jersey, lat. 38° 55' 59" n., long. 74° 57' 39" w. It

has a light of the first order 164½ ft. above mean high water. It is on the n. side of the entrance to Delaware Bay.

May, Isle of, island, Fifeshire, Scotland, at mouth of the Firth of Forth. On the May are the ruins of St. Adrian's priory (a 13th-century structure), and the miraculous holy well, to which pilgrims formerly resorted.

Maya, in the Vedanta philosophy, 'illusion' or 'deception,' the fictitious energy which, in conjunction with the supreme self (Brahman), produces the cosmic soul (Isvara). Maya is personified as a female form of celestial origin, created to beguile.

Mayaguez, tn., Porto Rico, W. Indies, 72 m. s.w. of San Juan. It is situated on a slope of Las Mesas Mountains, on the e. coast of the island. The harbor is large and well sheltered. The town has a public library, exports sugar, coffee, oranges, pineapples and cocoanuts; p. 19,000.

Maya-Quiché, a main division of the Central American Indians, and in some respects the most civilized people of the New World. They ranged along the eastern slope of the Mexican tableland into Yucatan, Guatemala, and Honduras. There are three distinct ethnical groups.

Mayas, chief branch of the Maya-Quiché family; still constitute the bulk of the inhabitants of Yucatan, where their ancient language is still spoken by about 1,700,000 people. The Mayas were distinguished for their architectural genius, astronomic lore, and picture writings. The whole of Yucatan and neighboring districts are strewn with the monumental ruins of ancient Maya cities, among which Palenque, Uxmal, Copan, Coban, Quirigua, and Chichen-Itza are conspicuous for the vast size, fine proportions, and elaborate carvings of their palaces, monoliths, and temple-crowned pyramids. Their calendaric system also reveals a surprising knowledge of astronomy.

Maybrick (née Chandler), Florence (1858), American woman, born in the South and married in 1881 to James Maybrick, an English cotton broker of Liverpool. In 1888 she was accused in an English court of having poisoned her husband. She was found guilty, and condemned to be hanged, the sentence being commuted by the home secretary to imprisonment for life. In January, 1904, she was released on a ticket-of-leave, and in August of that year returned to the U. S. She died in 1942.

May Day, the first day of May, has every-



May Day in the Olden Time—'Raising the Maypole.'

where been an important period in the religion of nature-worship. The festival of dancing round a tree, or Maypole, on the 1st of May, is another manifestation of the same idea. The may-pole dances fell into desuetude at a much earlier date in Scotland than in England.

With the rise of labor organizations, the nature of the observance changed. After the Labor Congress at Berlin in 1890, May 1 was dedicated to labor demonstrations throughout Europe. Since the World War this usage has been spreading in the United States. Workers affiliated with the Socialist and Communist parties have given the day a political character which distinguishes it from the purely holiday observance of Labor Day.

Mayenne. (1) Department, N.W. France; comprises nearly the whole of the basin of the river of that name, a r. bk. tributary of the Loire, the stream being known in its lower course as the Maine. The department once formed part of the provinces of Maine and Anjou. It is, on the whole, flat. Agriculture is the principal industry, and beet root and cider apples are raised. There are coal and iron mines, granite and slate quarries, and the manufactures comprise cotton spinning and linen. Capital, Laval. Area, 1,986 sq. m.; p. 297,732.

Mayenne, town, Mayenne department, France, on the River Mayenne; 18 m. n.e. of Laval. Calico and linen are manufactured; p. 9,961.

Mayer, Alfred Marshall (1836-97), American physicist, was born in Baltimore, Md., and was educated at St. Mary's College. In 1872 he was elected to the American Academy of Sciences. His investigations in acoustics and the elasticity of metals, as well as in electricity, magnetism, and heat, materially aided the progress of knowledge in those subjects. His chief contributions to scientific literature are his *Thermodynamics of Waterfalls* (1869); *The Earth, a Great Magnet* (1872); *Light* (with C. Barnard, 1877); *Sound* (1878).

Mayflower, The, the vessel which conveyed the Pilgrim Fathers from Southampton, England, to Plymouth, Mass., in 1620 (See PILGRIM FATHERS; PLYMOUTH COLONY.) A list of the passengers may be found in Bradford's *History of the Plymouth Plantation*; consult also McManus' *The Voyage of the 'Mayflower.'* The American yacht which successfully defended the America Cup against the *Galatea* in 1886 was also called *Mayflower*.

Mayflower Descendants, Society of, in the State of New York, was founded in 1894 at New York City, to preserve the memory, records, history, and other facts relating to the *Mayflower* pilgrims, their ancestors, and their posterity. All lineal descendants, male and female, over eighteen years of age, of the original pilgrims are qualified for membership, as well as all signers of the 'Compact.' The *General Society of Mayflower Descendants* was founded in 1897, and there are branches in New York, Connecticut, Massachusetts, Pennsylvania, Illinois, District of Columbia, Ohio, New Jersey, Wisconsin, Rhode Island, Michigan, Maine, Colorado, California, Washington, Kansas, and Indiana. Triennial meetings are held, usually at Plymouth, Mass.

Mayhem, the common law offense of maiming a person in such a manner as to affect his capacity to defend himself or to serve his country in war. A mere disfigurement which did not have this effect was not formerly comprehended within the term, though by modern statutes all crimes of violence resulting in permanent injury to the person are regarded as mayhem and are punishable as felonies.

Mayhew, Jonathan (1720-66), American clergyman, was born in Martha's Vineyard, Mass. He was an ardent supporter of the rights of the American Colonies, and was unjustly accused by the Tories of instigating the Boston Stamp Act riots. Mayhew preached a notable sermon against the Stamp Act in 1766.

Mayhew, Thomas (1593-1682), American colonial governor, was born in England, and became a successful merchant at Southampton. Receiving a grant of Martha's Vineyard and other islands from Lord Sterling, he came to America and established Edgartown on Martha's Vineyard in 1642.

Maynard, George Willoughby (1843-1923), American portrait and mural painter, was born in Washington, D. C. He did important work in the Congressional Library at Washington; the Appellate Court House, Waldorf-Astoria Hotel, and Metropolitan Opera House, New York; the Newark Court House, and the Bijou Theater, Boston. Among his paintings are: *Vespers at Antwerp*; *Strange Gods*; *The Oceanides*; *In Strange Seas* (Metropolitan Museum of Art).

Maynooth, town, county Kildare, Ireland; 15 miles n.w. of Dublin by rail. Its chief interest arises from *Maynooth College*, a Roman Catholic institution established (1795)

by an act of the Irish parliament during Pitt's ministry, to provide education for the Roman Catholic clergy. In 1869, by the Irish Church Act, the Maynooth endowment was withdrawn—a capital sum, fourteen times its amount, being granted to the trustees for the discharge of existing interests.

Mayo, maritime county, province of Connaught, Ireland, bounded on the n. and w. by the Atlantic Ocean, e. by Sligo and Roscommon, and s. by Galway. The rearing of cattle and agriculture are the leading industries. The fisheries (including salmon) are important. Area, 2,156 sq m.; p. 191,969.

Mayo, Charles Horace (1865-1939), American surgeon, brother of William J. Mayo and son of William W. Mayo (1820-1911), who was one of the pioneers in surgery in the Northwest, was born in Rochester, Minn. He was surgeon at St. Mary's Hospital, Rochester, Minn., after 1889 and professor of surgery in the University of Minnesota (Mayo Foundation) after 1915. His other medical positions have included Regent of the American College of Surgeons (1913); president of the Clinical Congress of Surgeons of North America (1914-15); president of the American Medical Association (1916-17). In February, 1915, with his brother, Dr. William J. Mayo, he donated \$1,500,000,000 for the establishment and endowment of the Mayo Foundation for Medical Education and Research at Rochester, Minnesota, in affiliation with the University of Minnesota. He wrote numerous papers on surgical subjects.

Mayo, Frank (1839-96), American actor, was born in Boston. His successes in legitimate drama were overshadowed by his later creations, *Davy Crockett*, a backwoods character, and *Pudd'nhead Wilson* in his own dramatization of Mark Twain's book.

Mayo, Henry Thomas (1856-1937), American naval officer, was born in Burlington, Vt. In April, 1914, while in command of the U. S. fleet at Tampico, he demanded an apology and a salute to the United States flag in reparation for the arrest by Mexican soldiers of the crew of an American despatch boat. He was made commander of the battleship squadrons of the Atlantic Fleet, with the rank of vice admiral, in June, 1915; and was commander-in-chief of the Atlantic Fleet, with the rank of admiral while serving in that capacity, 1917-19.

Mayo, Katherine (1867-1940), author, was born in Ridgeway, Pa. Her writing is clear, vivid and fearless, showing a painstaking

thoroughness and skill as a trained observer. Her published works include *The Standard Bearers* (1918); *Mother India* (1927); *Soldiers—What Next?* (1934).

Mayo, William James (1861-1939), American surgeon, son of Dr. William Worrell Mayo, and brother of Charles H. Mayo, was born in Le Seur, Minn. He was graduated from the University of Michigan (M.D., 1883) and became associated with his father in the practice of surgery in Rochester, Minn. He was a member of the Royal College of Surgeons of England and of Scotland; and wrote numerous papers on surgical subjects. The *Mayo Clinic* of St. Mary's Hospital was built up under the leadership of the Mayo brothers and its fame is now world wide. Not only has it associated with it a staff of physicians and nurses who rank high in the profession, but it is equipped with exceptional facilities for research and study. In February, 1915, Dr. Mayo, with his brother Charles H. Mayo, donated \$1,500,000 for the establishment and endowment of the Mayo Foundation for Medical Research and Education, in affiliation with the University of Minnesota.

Mayor, the chief magistrate of a city, town, or village. In the United States the mayor is in practically all cases elected by direct popular vote. He serves for a term of one to five years, the present tendency being toward terms of two and four years, and is usually eligible for re-election. In some cities he is subject to recall and in others—as the larger cities of New York and Michigan—he is removable, for cause, by the governor of the State. In the larger cities he has in general the power to recommend legislation; to veto measures passed by the council, which, however, may override his objections by a vote of two-thirds or more; and to make appointments to municipal offices, either with or without the confirmation of the council.

Mayo-Smith, Richmond (1854-1901). American economist, was born in Troy, O. He was an authority on the statistics of economics; edited the *Political Science Quarterly*; and published *Emigration and Immigration* (1890); *Sociology and Statistics* (1895); *Statistics and Economics* (1899).

Mayweed, Dog Fennel, or Stinking Camomile, an annual composite plant common in waste places throughout Europe, and naturalized in America. It has erect branched stems and large solitary heads of flowers with a disagreeable odor.

Mazanderan, province of N. Persia, lying between the Caspian Sea and the Elburz Mountains; area, 10,400 sq. m. Owing to the fertility of the soil, the Persians call the province the 'Garden of Iran.' Rice, wheat, and other cereals, cotton, mulberry trees, and a variety of fruits are produced.

Mazarin, Jules, or Giulio Mazzarini (1602-61), cardinal and Prime Minister of France, was born in Pescina, in the Abruzzi, Italy. On the death (1643) of Louis XIII., Mazarin was appointed by Anne of Austria first minister of the crown. Paris resented the firm rule of Mazarin, and in 1648 the movement known as the First or Parliamentary Fronde broke out. Later in the same year the Second or New Fronde broke out. This movement headed by Condé lasted till 1653, and for a time Mazarin was forced to bow before the storm, and retired to Brühl, near Cologne. On Sept. 7, 1651, Louis XIV. attained his majority; in December Mazarin returned, and Turenne joined the royal cause; and Condé, the leader of the nobles, became a rebel. Henceforward, till his death, Mazarin was the head of the government. His work was twofold—first, to restore order and to reorganize the finances; secondly to end the war with Spain. Mazarin was a famous collector of books and art treasures, and during his lifetime amassed a large fortune, most of which he bequeathed to the King. He was one of the founders of that centralization and of that cleavage between classes which ultimately led to the French Revolution.

Mazatlan, seaport town, Mexico, in the mining state of Sinaloa, on the Pacific coast opposite Cape San Lucas. The city is well built and well lighted, has a street railroad, two hospitals, and is the seat of a nautical school. It is in a coffee, cotton, and sugar district and is an important trade center; p. 30,000.

Mazeppa, Ivan Stephanovitch (1644-1709), leader of the Cossacks, and the hero of Byron's poem, was born in Kiev government, and became page to John Casimir, king of Poland. According to the poem, a nobleman, discovering his wife's intrigue with Mazeppa, caused the latter to be bound naked on a wild horse and left to his fate. History says that Mazeppa escaped to the Ukraine, where he became secretary to the Cossack chief Samoilovitch, whom he succeeded (1687).

Mazurka, national Polish dance, which derived its name from Mazovia, where it orig-

inated. The peculiar rhythm of the mazurka was much used by Chopin and by Wieniawski.

Mazzini, Giuseppe (1805-72), Italian patriot, was born in Genoa. After various failures to provoke a rising in Italy (1831-4), he remained in Switzerland till 1837, when he went to London, where he continued his political propaganda. His last attempt at



Giuseppe Mazzini.

raising a rebellion was made at Palermo in July, 1870, but again his efforts were thwarted. But two months later he saw the realization of all his hopes and aspirations when Rome was taken by the Italian army. While Garibaldi was the soldier of United Italy, and Cavour its statesman, Mazzini was its idealist and its spiritual founder. He must be acknowledged by both friends and foes alike to have been a man of immense energy and resource, and of great organizing power, who unquestionably had the full courage of his convictions, and was consistent and thoroughly sincere and disinterested in his aims. All his writings are inspired by the noblest thought, the deepest feeling, and passionate eloquence. Perhaps his two most sustained efforts are *The Thoughts upon Democracies in Europe* and *On the Duties of Man*.

M.B., Bachelor of Medicine.

M.D., Doctor of Medicine.

Mead, an ancient beverage of Europe, prepared by diluting honey with water and fermenting. The resulting liquid is golden yellow in color, but rather tasteless and in-

sipid. The name mead is also given to a beverage charged with carbonic acid gas and flavored with sarsaparilla.

Mead, Edwin Doak (1849-1937), American author and lecturer, was born in Chesterfield, N. H. He edited the *New England Magazine*, 1889-1901, and he was interested in all work for international peace, being one of the first directors of the World Peace Foundation and editor of its publications. For twenty-five years he was director of the Old South historical work in Boston, editing many leaflets and pamphlets.

Mead, Larkin Goldsmith (1835-1910), American sculptor, was born in Chesterfield, N. H. Among his chief works are the National Lincoln Monument at Springfield, Ill., the Soldiers' Monument at St. Johnsbury, Vt., the pediment over the Agricultural Building at Chicago (1893). His work is characterized by a conscientious attention to detail.

Mead, William Rutherford (1846-1928), American architect, brother of Larkin G. Mead, was born in Brattleboro, Vt. In 1877 he became a member of the firm of New York architects, McKim, Mead and White. In 1909 he was elected president of the American Academy in Rome, and in 1910 was made a member of the National Academy of Design. He has been identified particularly with the Pennsylvania Railroad Station, the Bellevue Hospital, and the Brooklyn Institute, all in New York City.

Meade, George Gordon (1815-72), distinguished American general, was born in Cadiz, Spain. The outbreak of the Civil War in 1861 found him a captain of topographical engineers. On August 31 of that year he was appointed brigadier general of volunteers. On the 28th of June, 1862, at a critical stage of the operations, General Hooker was removed from command of the Army of the Potomac, and General Meade was appointed to the position. When General Grant was made commander-in-chief of all the armies of the Union and assumed direction of operations in the East, he asked General Meade to remain in command of the Army of the Potomac. Meade consented and contributed greatly to the success of the campaigns which finally resulted in the capture of Richmond and the surrender of Lee. For his eminent services he was commissioned major general of the regular army in August, 1864, and at the conclusion of the war was thanked by Congress for his success at Gettysburg.

Meadow Lark, a familiar field-bird, resident throughout all temperate North America, and in autumn included among the minor game-birds. There are two species, the Eastern Meadow or Field Lark (*S. magna*), and the Western Meadow Lark (*S. neglecta*). The meadow larks are related to the starlings, are about 10½ inches long, and have a brown-streaked back, and bright yellow breast, marked in the male with a conspicuous black crescent; the female wears duller tints and a streaked vest.

Meadow Mouse, also known as **Field Mouse**, a small dark brown rodent found in the eastern part of the United States from Maine to North Carolina and westward to the plains. It is about 6 to 7 inches long with a thick body and short legs. It inhabits the fields and meadows.



Meadow Sweet.

1, Flower section.

Meadow Sweet, or **Queen of the Meadow**, a European herbaceous plant, which belongs to the order Rosaceæ. It grows to about three feet in height, and is common in moist land. It has pinnate leaves, and bears in late summer small, densely crowded, yellowish-white, fragrant flowers.

Meagher, Thomas Francis (1823-67). Irish-American soldier, was born in Waterford, Ireland. He joined the Young Ireland

party in 1846 and eventually became its leader. In 1848 he was arrested and sentenced to death for treason, but was exiled to Tasmania instead. Escaping to the United States in 1852, he practised law, and in 1861, after raising a company of Zouaves and participating in the battle of Bull Run, organized the Federal 'Irish Brigade,' and was colonel of one of its regiments. The following year he was promoted brigadier general and fought gallantly in many important battles until after the battle of Chancellorsville, when he resigned. He published *Last Days of the Sixty-Ninth New York Regiment in Virginia*.

Meal Worm, the larva of the beetle *Tenebrio molitor*, abundant in flour mills, bakehouses, and similar localities. Meal worms are reared in confinement in large numbers as food for cage-birds.

Mean, in mathematics, is a term interpolated between two terms of a series.

Mean, in philosophy, the term used to designate briefly an ethical doctrine of Aristotle, according to which virtue is defined as a habit of choosing the mean between the two extremes of excess and defect in action and feeling. Excellence of conduct, says Aristotle, depends on the attainment of a true balance in action and feeling, regard being had to all the circumstances of the case.

Measles, an acute, highly contagious fever the causative organism of which has not yet been discovered. Infection is by direct contact in most cases, but, since the virus is in the nasal and buccal secretions, it may be transmitted by coughing and sneezing or simply by close proximity. The period of invasion is the period of great infectiousness, and is characterized by fever, catarrh of the eyes, nose and throat, and an exanthem on the mucous membranes. At this time Koplik's spots (described in 1896) appear on the congested interior of the mouth, being minute bluish-white specks surrounded by a red areola, localized first on the mucous membrane of the cheeks from which they spread. They are a sure sign of measles. The rash appears on the thirteenth or fourteenth day after infection and usually after three or four days of catarrh and fever. The view held by the laity that measles is of minor importance is erroneous; it is exceedingly fatal in early life and is one of the chief causes of death between the ages of one and three years, the mortality being particularly high among the malnourished, rachitic, and debilitated, or when it complicates sanitary

conditions. German measles is a lighter form than ordinary measles.

Measuring Worm, any one of the larvæ of the super-family Geometridæ. They are also known as loopers or spanworms, the name being derived from their peculiar method of locomotion, in which each forward step is effected by bringing the caudal end of the body up to the thoracic feet. There are some 800 species of moths, all having slender bodies and broad wings. The best known measuring worms are the canker worms and the currant worms.

Meat, a term in its broadest and commercial sense meaning all portions of the dressed carcass of animals used as food. All meat is composed of proteins, fat, carbohydrates, ash and water. In addition to these constituents meat contains vitamins; pork in particular is rich in vitamin B. and kidney and liver also contain an abundance. Beef and mutton furnish small quantities of vitamin B.; and the fat of the animals is one source of vitamin A. Meat after slaughter undergoes certain chemical changes known collectively as ripening, a process which requires from two to three weeks. In the first stages of the ripening process, after the passing off of the rigor mortis, extractives are formed which give added flavors to the meat, and this is the time when meat should be consumed, although in very warm tropical countries it is often necessary to use the meat during the rigor mortis stage.

Cattle.—The meat of steers, which animals furnish the prime grade of beef, is very light red and of fairly firm consistency, while the fat is also firm and white in color and so dispersed through the muscle bundles as to give the much sought-for marbled appearance. The illustrations on page 3177 show the various cuts of beef, veal, pork and mutton.

Calves.—This meat is very pale, being almost white in milk-fattened animals, but is rather tough, while the fat is reddish white shortly after slaughter, gradually changing to pure white.

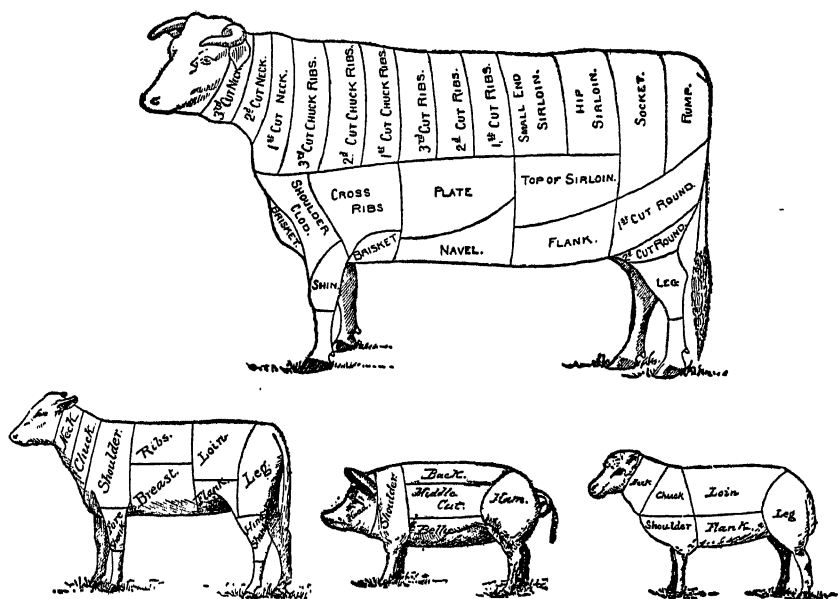
Sheep.—Mutton is light red in color and has a characteristic sheepy odor, while the fat is pure white and odorless. In well fed animals the fat is abundant, especially about the kidneys and beneath the skin.

Goats.—Goats' meat can usually be distinguished from mutton by its characteristic odor and the lack of deposits of fats except around the kidneys, and the prominence of the bony processes.

Hogs.—The meat of the hog is pale red, some parts being white with usually pure white fatty tissue, although this varies somewhat with the food and breeding. Upon cooling the meat becomes white.

Value as a Food.—Investigations carried on by the U. S. Department of Agriculture have established the fact that meat forms 16 per cent. of the quantity, 30 per cent. of the protein, and 59 per cent. of the fat in the ordinary American diet. Meat proteins and fats are highly digestible and its mineral constituents are necessary elements to the

dustries in the United States. It comprises the breeding, raising, feeding and preparing for market of the various species of meat-producing animals, most important of which include cattle, sheep and swine; while of lesser importance but still of large commercial value may be mentioned chickens, turkeys, ducks, and pigeons. The feeding of live-stock preparatory to slaughter is of prime importance and a large percentage of the cattle killed in the large abattoirs of the country is purchased after maturity and fattened by professional feeders who have noth-



. Various Cuts of Meat: Upper, Beef; Left, Veal; Center, Pork; Right, Mutton.

human body. It is prepared in many ways in the fresh state and exists to a still greater variety and extent in dried, salted, canned, pickled, smoked, and extracted forms. The per capita consumption of meat in the United States is about 135 pounds and the amount annually produced is around 20,000,000,000 pounds, the larger per cent. of which is pork. Argentina, Australia, New Zealand, Canada, the United Kingdom and Germany are also large meat consumers, the per capita consumption in all being over 100 pounds. In other European countries the per capita consumption ranges from 45 to 80 pounds annually.

Meat Production.—The production of meat is one of the most important agricultural in-

ing to do with the breeding and raising of the animals. The section of the United States at present most largely employed in the breeding and raising of beef cattle is the wide range country of the West; while the feeding areas lie almost exclusively in the corn belt, comprising the States of Kansas, Missouri, Iowa, Nebraska and Illinois. At the present time the meat industry of the United States is conducted on a gigantic scale. The small butcher is rare, and at least fifty per cent. of the live-stock slaughtered in the country is killed by the large packing companies situated in Chicago, Kansas City, Omaha, and St. Louis. Capitalized at millions of dollars, these companies practically control the industry. The large

scale on which their business is done enables them to economize in ways impossible to the small butchers, and aided by the present improved system of refrigerator cars they can successfully compete with the small retailer in the remotest parts of the country. In these modern plants the latest improved machinery is used, and the work is done by skilled workmen, which renders possible the supply of the greatest variety of animal products, fresh, cured, and canned. With the growth of the United States, and the opening of the rich pasture lands of the West, the breeding of beef cattle, sheep, and hogs has increased to a marvellous extent. The export trade in animal products originated in 1876, since which time it has grown to such proportions that the United States now ranks second among the meat exporting countries of the world.

Government Inspection of Meats.—The United States government, thoroughly aware of the danger to the public health of meat affected with disease, has devised an elaborate method for controlling this danger. After various statutes had been enacted which did not prove entirely satisfactory, at length in 1906 an act was passed which assures a wholesale and hygienic meat supply to the public. This act provides that all cattle, sheep, goats, and hogs shall be subject to ante-mortem examination. It further provides for the post-mortem inspection of all cattle, sheep, swine and goats, the products of which are intended for interstate or foreign trade. Those found fit for human food are marked 'inspected and passed,' and those carcasses found diseased or otherwise unfit for food are marked 'inspected and condemned,' and all such condemned meats are destroyed in the presence of a government inspector. Furthermore, power is granted the Secretary of Agriculture to destroy all meat food products containing dyes, chemicals or ingredients which render the meat unfit for food. And all food products prepared in any official establishment for the purpose of placing in cans, tins, pots, or other receptacles must be under the supervision of an inspector. See FOOD, PACKING INDUSTRY.

Meath, maritime co., Irish Free State, in the province of Leinster; area 940 sq. m. Pasturing and agriculture are the chief industries; coarse linens and woollen goods are manufactured. There are many remains of ancient castles and monasteries. Kells is famous for its ecclesiastical antiquities, and

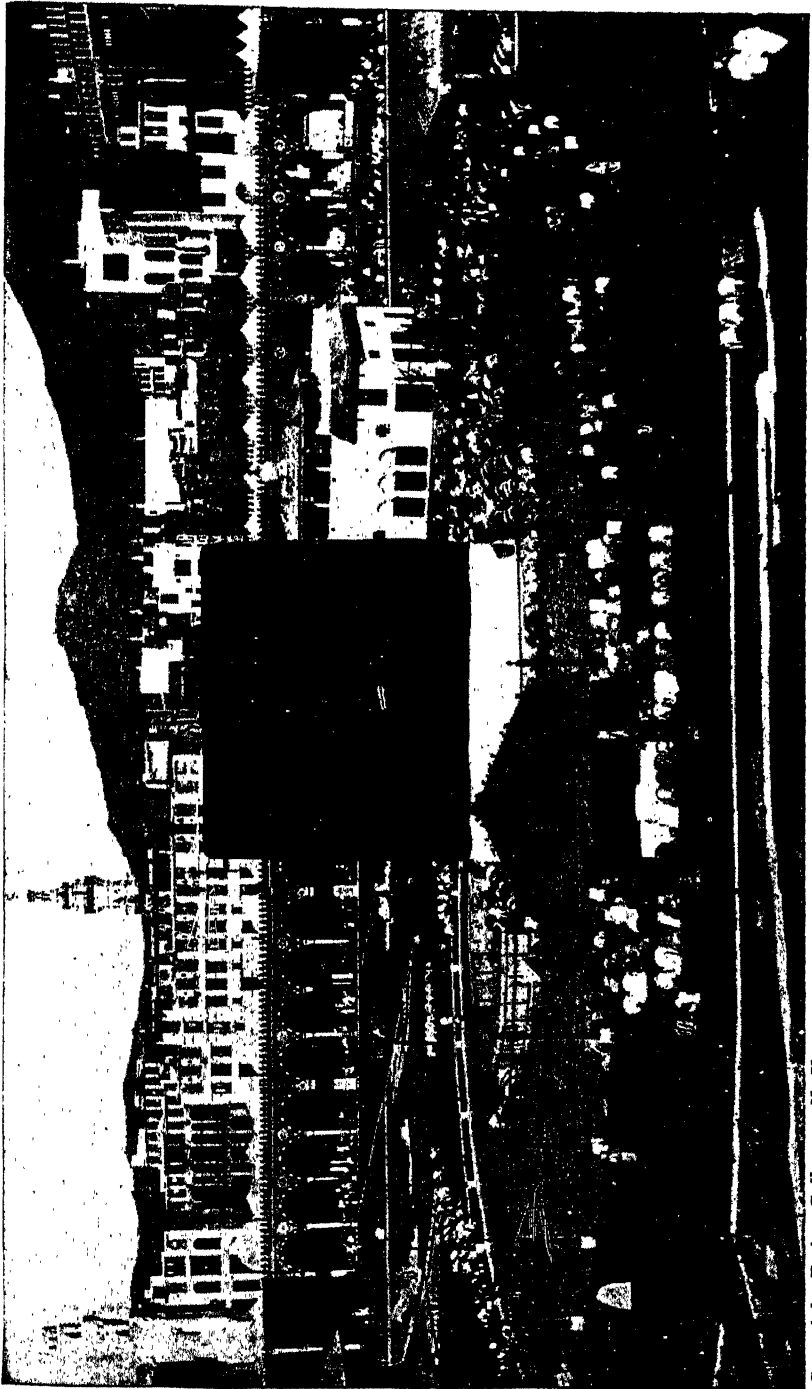
Tara is the traditional site of the early Irish capital; p. 62,969.

Meaux, town, France, in the department of Seine-et-Marne, on the Marne River; 25 m. n.e. of Paris. Its cathedral, which contains the remains of Bossuet and is perhaps its most important building, dates from the twelfth century. The town is the home of the famous Brie cheese. It was occupied by German patrols for a short time in September, 1914, and during the battle of the Marne received a few shells but was not badly damaged. In 1918 it was several times bombarded; p. 14,000.

Mecca, capital of Kingdom of Saudi Arabia, 70 m. e. of its port, Jedda. It is the birthplace of Mohammed and as such and as the scene of the annual pilgrimage (hajj), it is the holy city of the Mohammedan world. The great mosque, Beit Allah, containing the Kaaba lies in the lower part of the town. The Kaaba is a massive, cube-like structure, said to have been founded by Abraham. The black stone at one of the angles is a special object of veneration. One of the most important of the sacred rites is to walk seven times round the Kaaba. The permanent residents are estimated at 85,000. Mecca is supposed to have been the home of Ishmael and his descendants, and of other early tribes. In spite of struggles for independence, it has been under the supremacy successively of Arabian, Egyptian, and Turkish rulers. In 1916 Sherif Hussein, aided by the British, threw off his allegiance to the Turkish Sultan and assumed the title King of the Hejaz. In 1927 a treaty was signed with Great Britain which guaranteed the protection and good treatment of the pilgrims to and from their journey to Mecca. Consult Wavell's *A Modern Pilgrim in Mecca* (1921); Rutler's *The Holy Cities of Arabia* (1928). See ARABIA.

Mechanical, a term which, when used in physical science, means the uniform and invariable effects that result from the interaction of quantitatively determinate elements, according to quantitatively determinate laws. Since the time of Kant, mechanical in this sense has been sharply opposed to organic or teleological. Consult Kant's *Kritik of Judgment*; Janet's *Final Causes*; Ward's *Naturalism and Agnosticism*.

Mechanical Engineers, The American Society of, an association founded in 1880 to promote the art and science of mechanical engineering and the allied arts and sciences. It is one of the four founder societies occu-



Copyright Ewing Galloway, N. Y.
Mecca: The Great Mosque and the Kaaba which encloses the Black Stone.

pying the Engineering Societies Building in New York City, a building the erection of which was largely dependent upon funds contributed by the late Mr. Andrew Carnegie. Publications of the Society include *Mechanical Engineering*, issued monthly, the *A.S.M.E. News*, issued semi-monthly, the *Transactions*, issued in sections classified according to the interests of its Professional Divisions, each section appearing quarterly, the *Record and Index*, a complete record of the year's activities, and the *Engineering Index*. A broad research programme is carried out and many codes and standards have been formulated.

Mechanics, the science of forces, motions, and stresses, is the foundation of engineering. Pure mechanics is the science of forces and motions without reference to the properties of substances except weight. It comprises the study of the equilibrium of force-system (*statics*), and the relations between forces and motions (*kinetics*). It is based on generalizations from experience summarized in Newton's 'laws of motion.' (See MOTION, LAWS OF.) The results of pure mechanics are independent of the nature of the substance of the body, but the latter profoundly affects the distribution of the forces concerned. This effect is studied in one branch of Applied Mechanics, concerned with the internal forces (stresses) produced in bodies by externally applied forces; this is sometimes called Mechanics of Materials, or Theory of Elasticity. The other main branch of applied mechanics is the study of force-actions in machines (moving assemblages). Forces and motions in liquids are the subject of Hydromechanics (comprising hydrostatics and hydraulics), which is properly a part of applied mechanics, but is usually treated separately.

The principles of the elementary machines (wedge, screw, pulley, lever) were in large part known to the ancients (Archimedes, 250 B.C.). In the Middle Ages, Galileo, Stevinus, Newton, and others established the underlying relations of both statics and kinetics. The mathematical details of most applications were fully worked out by the great mathematicians, physicists, and astronomers of the 17th and 18th centuries. Stress analysis of the simpler structures also dates from that period, but analysis of frames (trusses) was developed during the 19th century.

The essential principles of pure mechanics may be stated as follows: Force exists as attraction or repulsion between two bodies,

visibly or invisibly. It is visible in contact pressure, as when the hand lifts a book; invisible in magnetic attraction or in the earth's gravitational pull. Force always pulls or presses equally on both bodies concerned; the apple pulls upward on the earth, precisely as much as the earth pulls downward on the apple. As we are usually interested in the effect on only one body at a time, a force may be treated as single-ended. The force of gravity is the most available standard, hence forces are measured in pounds. (See GRAVITATION; UNITS, DYNAMICAL; KINEMATICS; LEVER; ELASTICITY; HYDROKINETICS; HYDROSTATICS; STRENGTH OF MATERIALS; and references under DYNAMICS. For pure mechanics and practical cases, consult Maurer's *Technical Mechanics*. For stress analysis, consult Merriman's *Mechanics of Materials*; Church's *Mechanics of Engineering*, and works on bridges.

Mechanics' Lien, a statutory lien upon real estate to secure the contractor who has by labor or materials contributed to the improvement of the premises. Statutes permitting the creation of this lien exist in all of the United States. It is limited to the premises, sometimes to the building only, on which labor or materials were expended. The mechanics' lien takes its place in order of priority with other liens or incumbrances on the land, and may, if not discharged, be foreclosed by a statutory process similar to the statutory foreclosure of a mortgage. See LIEN. Consult Boisot's *Mechanics' Liens*.

Mechanicsville, Battle of, a battle of the American Civil War, fought on June 26, 1862, about 7 m. n. e. of Richmond, Va., between a Federal force of about 5,000 under Gen. Fitz-John Porter and a greatly superior Confederate force under the immediate command of Generals Longstreet and A. P. Hill, in which the Federals gained the advantage. This was the beginning of the 'Seven Days' Battle' of the Peninsula. The engagement is also known as the battle of Beaver Dam Creek. See PENINSULA CAMPAIGN.

Mechitarists, or Mekhititarists, a congregation of Armenian Roman Catholics, who derive their name from Mechitar da Pietro (1676-1749). In 1701 he founded at Constantinople a society for the intellectual and spiritual improvement of his countrymen, but was forced by the persecution of the Armenian patriarch to betake himself with his adherents to Modon in the Morea, then under Venetian rule.

Mecklenburg, two states of the German

republic (Mecklenburg-Schwerin and Mecklenburg-Strelitz), lying south of the Baltic Sea; combined area, 6,266 sq. m. Agriculture is the most important industry, and the leading crops are rye, oats, wheat, sugar beets and potatoes. Sugar and starch factories, breweries and distilleries, and machinery and brick establishments are other leading industries. The capital of Mecklenburg-Schwerin is Schwerin; of Mecklenburg-Strelitz, Neustrelitz; p. Mecklenburg-Schwerin, 675,000; Mecklenburg-Strelitz, 110,000.

Mecklenburg Declaration of Independence, in American history a series of resolutions, said to have been passed on May 20, 1775, at a meeting in Mecklenburg co., N. C., asserting the independence of the inhabitants of the county from British rule and first published (from memory) in 1819. Their authenticity was early questioned, and has given rise to much controversy.

Medal, a circular piece of metal issued to record or commemorate an event or a person. It is usually embellished with devices and inscriptions representative, symbolical, or connected with its particular purpose. Almost invariably a medal is decorated on both sides. Probably the first distinct series of medals in the modern sense are the Roman medallions issued between the first and the middle of the 4th century. They are usually in bronze, though a few in the precious metals have been found, and like the contemporary copper money of Rome, were struck from engraved dies. An international medalic exhibition, held in New York in March, 1910, showed an awakened interest in the subject. Consult Head's *Synopsis of British Museum, Department of Coins and Medals* (1881); American Numismatic Society's *Catalogue of the International Medallic Exhibition* (1910).

Medal of Honor, Congressional, according to existing laws is awarded by the President of the United States, in the name of Congress, to such person who, while an officer or enlisted man of the United States military or naval forces, shall in action involving actual contact with an enemy distinguish himself conspicuously by gallantry and intrepidity at the risk of his life, above and beyond the call of duty. On March 25, 1776, the Continental Congress voted that a gold medal be awarded to Gen. George Washington, for the retaking of Boston. The first Army Medal of Honor was issued by and under the authority of the provisions of a resolution of Congress approved July 12, 1862, this giving the United States a military

equivalent to the Victoria Cross of England and the Iron Cross of Prussia. Ninety Medals of Honor were awarded to American soldiers for services rendered during the World War. Six were bestowed upon the Unknown Soldiers of the British, the French, the Belgian, the Italian, the Roumanian and the American Armies, and were laid upon their graves. See also MILITARY MEDALS AND DECORATIONS.

Medals of Honor, Foreign. See **Orders of Knighthood; Military Medals and Decorations**.

Medellin, chief town, Colombia, South America, in the department of Antioquia; 150 m. n.w. of Bogotá. It is a well built town. Gold, silver, coffee, and hides are exported; p. 120,440.

Medford, city, Massachusetts, 5 m. n.w. of Boston, of which it is a residential suburb. It is the seat of Tufts College; p. 63,083.

Media, ancient country of Asia, s. of the Caspian Sea, in modern Persia. Its kings appear first as vassals of Assyria. About 700 B.C. Deioces threw off the Assyrian yoke. Cyaxares extended the rule of Media west as far as the Halys. Cyaxares' successor Astyages (585-549 B.C.), was overthrown which transferred the power of the united Medes and Persians to the Persian section and its ruler Cyrus. Henceforward the history of Media is that of Persia. See PERSIA.

Medical Association, American, a national society of physicians, founded in 1847, to raise the standard of medical education in the United States. Its present membership is more than 98,000. Its purposes are to promote the science and art of medicine; to organize the medical profession and safeguard its interests; to elevate the standard of medical education and practice; to bring about the enactment of uniform legislation for the public welfare; and to protect public health and form public opinion in regard to problems of hygiene. The association publishes *The Journal of the American Medical Association*, and five other scientific journals.

Medical Care, Cost of. In 1932 a report was presented by the Committee on the Cost of Medical Care which embodied five years of research into the economics of medicine. The committee, headed by Dr. Ray Lyman Wilbur, was supported by eight well-known foundations. It recommended the formation of community and State medical centers supported by insurance or taxation and dealing with both the prophylactic and therapeutic aspects of community health.

Medical Department, U. S. Army, consists of a Surgeon General with the rank of major general, two assistants, a medical corps, a dental corps, a veterinary corps, a medical administrative corps, an enlisted force of a strength approximating 5 per cent. of the actual strength of the Regular Army, a nurse corps of women, and a relatively small number of civilian physicians known as contract surgeons. See HOSPITALS, MILITARY; SANITATION, MILITARY.

Medical Department, U. S. Navy, consists of a medical corps, dental corps, navy nurse corps and hospital corps. Administrative control rests in the Bureau of Medicine and Surgery, of which the Surgeon General of the Navy is chief. The members of the Medical Corps are appointed from civil life, either as assistant surgeons or acting assistant surgeons, and must pass a rigid professional examination.

Medical Education. Hippocrates wrote many admirable medical treatises that controlled medical thought for 1400 years. Galen was another early teacher of lasting influence. Until the Renaissance, medical teaching consisted almost wholly of lectures upon the works of these two teachers. During the Middle Ages, Salerno boasted a medical school. Montpellier was scarcely less celebrated; and in 1205 the University of Paris was established. In the 16th century, Padua, Bologna, and Pisa were centers of medical teaching. Germany early maintained medical departments in her universities. (See also MEDICINE, HISTORY OF.)

United States.—In 1765 Drs. John Morgan and William Shippen, Jr., founded the medical department of the College of Philadelphia, which became the University of Pennsylvania. The year 1767 saw the foundation of the medical department of King's College, New York, now Columbia University. The medical department of Harvard University was organized in 1782; that of Dartmouth in 1798; that of Yale in 1817. In the absence of restrictive laws, independent schools were established by physicians. The American independent school was started without the necessary hospital connection, and it obtained the right to confer the degree, which, for many years, carried with it the right to practise. Well into the eighties demoralization was practically complete: there were no entrance standards; the instruction occupied only six months of two successive years, and the facilities were in many places so meager that the teaching was almost wholly didactic.

In the last forty years, however, there has been a steady improvement. The course of study is now everywhere four years; many schools have made good hospital connections; laboratory instruction has been greatly improved; and State examining boards have been created to control the license to practise (see MEDICAL PRACTITIONER). Today, in the United States, the principal medical schools demand of the entering student a baccalaureate degree, or require him to pass examinations equivalent to those usual at the completion of the second year in college.

Medical Education of Women.—Until 1900, the medical colleges of Germany were closed to women, and it was not until 1876 that Parliament passed a bill permitting their presence in the medical schools of Great Britain. In the United States, the Boston Homœopathic School for Women was established in 1848. In recent years there has been a marked tendency to open medical schools to women and men alike. The State universities of the West, the Canadian schools, and endowed universities such as Johns Hopkins, Pennsylvania, Cornell, Columbia, Tulane, and Harvard, now pursue this policy. See MEDICINE, HISTORY OF; MEDICAL PRACTITIONER. Consult *Bulletin* of the Carnegie Foundation for the Advancement of Teaching on *Medical Education in the United States and Canada*. (annual).

Medical Inspection of Schools may be defined as an extension of school activity in which the physician and educator unite in the endeavor to secure for each child the best conditions of health and vitality so that he may take the fullest advantage of the free education offered him by the State. The first city in the United States to have a regular system of medical inspection was Boston, which started such a system in 1894. In 1930 all cities of the United States with a population of 100,000 or more had medical inspection of school children.

Medical Jurisprudence, or Forensic Medicine, is 'the science which teaches the application of every branch of medical knowledge to the purposes of the law.'

Medical Practitioner. In the United States, the right to practise medicine depends upon obtaining a license from the State board of health or the State board of medical examiners. The license is issued only after an examination, almost altogether in writing. The candidate must be of good moral character and at least twenty-one years of age. Before he is admitted to examination, however, he is

required in most States to file a diploma showing that he has obtained the degree of M.D. after at least four years of study in a recognized institution. The professional examination includes at least the following subjects: chemistry, anatomy, physiology, pathology, and bacteriology, materia medica and therapeutics, medicine, surgery, obstetrics. In most of the States there is only one board of medical examiners, before whom all applicants must appear. A certain degree of reciprocity in recognizing one another's licensing examinations exists among the States. See MEDICAL EDUCATION. Consult *Laws and Board Rulings Regulating the Practice of Medicine in the United States and Elsewhere*, published annually by the American Medical Association.

Medici, a Florentine family which first came into prominence in the 14th century. The real founder of the greatness of the house was Giovanni de' Medici (1360-1429), who by banking and commerce amassed enormous wealth. With Lorenzo (1492-1519) the direct line of the Medici came to an end. Consult Symonds' *Italian Renaissance*; Smeaton's *Medici and the Italian Renaissance*.

Medicinal Herbs. The old herbalists largely based their practice on the so-called 'doctrine of signatures,' according to which the several herbs have legible characters stamped upon them, to show what evil they will most readily cure. Among the more important plants now officially recognized by physicians are foxglove or digitalis, belladonna, squill, poppy, aloe, rhubarb, henbane, nux vomica, cinchona, hemlock, aconite, stramonium, and jalap.

Medicine, History of. The history of medicine may be divided into five great periods.

Prehistoric Medicine.—The earliest known physician lived in the third Egyptian Dynasty, about 4500 B.C. Engravings dating about 2500 B.C., depicting surgical operations, have been found. The earliest known surgical instruments are copper knives found in a tomb near Thebes, dating from about 1500 B.C. The ancient Hebrews were remarkable for the good hygiene they advocated (consult *Leviticus*), but there was no special medical education among the Jews until the Alexandrian period. The medicine of the Hindus is a history of elaborate errors, but they excelled in surgery, their cataract operation still being used. Chinese medical history has been practically stationary for many thousands of years and is now at about the level which

European medicine attained in the 13th century.

Japan has a remarkable capacity for assimilating European knowledge. The modern school of medicine began at the time of the revolution (1868), and for the past fifty years the Japanese have practically kept pace with European medicine.

Classical Period.—This period began in 460 B.C. and lasted until 476 A.D. Hippocrates was the real father of medicine; his descriptions of disease are still of value. His clinical histories were the only things of their kind for 1,700 years. After Hippocrates there were no great men in medicine until Aristotle (384-422 B.C.), whose contributions to medical science were the study of comparative anatomy, embryology, and formal logic. Roman medicine before Galen was a riot of theories. Dioscorides may be said to have originated the *Materia medica* and Aretæus ranked next to Hippocrates as a clinician and writer. Galen (131-201 A.D.) was one of the greatest figures in ancient medicine. His two chief theories were that disease is abnormal and that health may be conserved by upbuilding the body.

Medieval Medicine.—There was little progress in medicine during the Middle Ages. The best-known name of this period is that of Avicenna (980-1037). The most prominent physicians of the Western Caliphate were Avenzoar, who described the itch mite, and Moses ben Maimon, Saladin's private physician.

The medical school at Salerno arose from a health resort there; its first eminent patient Robert, son of William the Conqueror, was cured there of a wound in 1101. The school lasted seven centuries, being abolished by Napoleon in 1811. The term 'doctor of medicine' was first applied to the graduates of Salerno by Gilles de Corbeil in the 12th century. Henri de Mondeville (1260-1320), advocated clean surgery and thus may be said to have been the first asepsist.

Philosophical Medicine may be said to have begun with Paracelsus (1493-1541). He was the only asepsist between Mondeville and Lister. Andreas Vesalius (1514-64) was 'the most commanding figure between Galen and Harvey' (Garrison). In 1543 he published his *De Fabrica Humana Corporis*. Two of his pupils became famous, Fallopius (1523-62) and Eustachius (1524-74).

The greatest physician of the 17th century was William Harvey (1578-1657), who discovered the circulation of the blood in 1628

His other great contribution was his theory of generation. Thomas Sydenham (1624-89) was a famous practitioner, and John Gaunt published the first book of vital statistics in London in 1662. Herman Boerhaave (1668-1738), was the greatest clinician of the 18th century. He was the first to prove that smallpox was contagious. Von Haller (1708-93) was one of the world's three greatest surgeons. Towards the end of the 18th century came the successful introduction of vaccination against smallpox, by Edward Jenner (1749-1823). (See VACCINATION.)

Five medical schools were started in the United States before 1800, but only two survived, those of the University of Pennsylvania (1765) and Harvard University (1782). Parkinson (1755-1824) reported the first case of appendicitis in England in 1812. In 1819 Laënnec (1781-1826) invented the stethoscope. Quinine was discovered by Pelletier and Caventou in 1820. The English clinician, Richard Bright, (1789-1858), distinguished between the various forms of kidney disease and Bright's disease was named. Thomas Addison (1793-1860) wrote a monograph on the *Local and Constitutional Effects of Disease on the Suprarenal Capsules*. (See ADDISON'S DISEASE.) Semmelweis (1818-65) discovered the true cause of puerperal fever in 1847. (See PUERPERAL INFECTION.)

Samuel Christian Friedrich Hahnemann (1755-1843) founded Homeopathy, but Homeopathy has departed widely from the teachings of its founder. (See HOMŒOPATHY.)

Scientific Medicine may be said to have begun about the middle of the 19th century. The father of bacteriology may be said to be Louis Pasteur (1822-95), who first assumed and then proved a specific type of organism for each form of fermentation, and subsequently applied his findings to disease, leading to the demonstration that various diseases are caused by micro-organisms and to the preparation of vaccines to produce immunity to their action. Robert Koch (1843-1910) was the first to devise and to emphasize the necessity for accurate methods of obtaining pure cultures.

From the work of Lord Lister (1827-1912) has arisen all present-day surgery with its asepsis and antisepsis. (See SURGERY; ANTISEPTICS.)

Claude Bernard (1813-78) was the leading physiologist of the century. His great discovery was of the glycogenic function of the liver. Cannon and Harvey Cushing in Ameri-

ca and Pavlov in Russia have continued along the lines laid down by him. The chief contributions to bacteriology in the past fifty years have been the discovery of the malarial parasite (see MALARIA) by Laveran in 1881, of the tubercle bacillus (see TUBERCULOSIS) by Robert Koch (1843-1910) in 1882, and of the spirochete of syphilis by Schaudinn in 1905, the establishment of the causative relationship of the *Streptococcus scarlatinae* to scarlet fever by G. H. Dick and G. F. Dick in 1923. Closely related to the bacteriology is the development of vaccine and serum therapy. August von Wassermann in 1906 perfected a diagnostic method by which a test of the blood will reveal syphilis even if there are no clinical signs, and in 1909 Paul Ehrlich discovered an arsenical preparation which will kill the germs of syphilis without injuring the tissues of the body. Later he discovered an even more efficient preparation which he called neosalvarsan, or '914.' More recent advances include the use of bismuth, the Swift-Ellis method of treating nervous syphilis, and the treatment of paresis by inoculation with the malarial parasite.

The use of anesthetics (see ANÆSTHESIA), have prevented untold suffering. In 1842-43 Crawford W. Long used ether in several cases. In 1844 Horace Wells, a dentist, began to use laughing gas. Chloroform was discovered by Guthrie, Liebig, and Soubeiran in 1831, purified and named by Dumas in 1834 and in 1847 used by Sir James Young Simpson in obstetrics. Cocaine was not used in medicine until 1884, when Carl Koller called attention to its advantages as a local anæsthetic. (See ANÆSTHESIA). Mention may also be made of the work of George W. Crile, who elaborated the theory of 'anoci-association.'

Hypodermic injections were first given for the relief of pain by Francis Rynd of Dublin in 1845 and the hypodermic syringe was introduced to the profession by Pravaz in 1852. The laryngoscope was first used by V. von Bruns in 1862. Electrotherapy was first used in modern medicine about 1850 by Duchenne. The X-rays were discovered by Wilhelm Conrad Röntgen in 1893 and are called by his name. (See ELECTRICITY IN MEDICINE AND SURGERY; RADIOACTIVITY; VACUUM TUBES.)

Mental medicine was in a chaotic state until Emil Kraepelin brought order into its study. In 1895 Sigmund Freud promulgated a new psychology which he termed psychoanalysis; his two chief disciples, C. G. Jung, and Alfred Adler, later started schools of their own (see PSYCHOTHERAPY). Alfred Binet and

Th. Simon in 1905-08 devised tests for measuring the intellectual capacity of children; Goddard, Yerkes, Fernald, and Healy have done similar work. In 1856 Sir W. H. Perkin obtained aniline dyes from coal-tar products and this was the beginning of the production of the coal-tar drugs, the best known of which are acetanilid, aspirin, and phenacetin. In 1910 R. G. Harrison demonstrated that nerve cells could be preserved and grow outside of the body. Then Alexis Carrel proceeded to preserve other tissues outside of the body and even transplanted organs and limbs from man to man.

An outgrowth of war medicine and surgery was the Carrel-Dakin technic for the treatment of infected wounds by extensive *débridement* or excision of lacerated tissues, and irrigation with a solution of sodium hypochlorite (Dakin's fluid).

One of the most famous practitioners of the past fifty years was Sir Wm. Osler (1849-1919), whose *Principles and Practice of Medicine* is the best English textbook of our time. See especially the articles on ANATOMY and SURGERY in this work, with the cross references there cited; BACTERIA; BIOLOGY; DIET AND DIETETICS; ELECTRICITY IN MEDICINE AND SURGERY; FIRST AID; HYGIENE; HOSPITALS; PATHOLOGY; NURSING; SANITARY SCIENCE; SERUM THERAPY; VACCINE THERAPY.

Bibliography.—On the history of medicine, consult: Park's *An Epitome of the History of Medicine*; D. A. Gorton's *The History of Medicine*; V. Robinson's *Pathfinders in Medicine* (1912); F. H. Garrison's *History of Medicine* (4th ed., 1929).

Among general and special works on medicine, the following may be consulted:

C. P. Emerson's *Essentials of Medicine*; R. C. Cabot's *A Layman's Handbook of Medicine* (1916); M. J. Rosenau's *Preventive Medicine and Hygiene* (2d ed., 1916); *The Practical Medical Series* (10 vols., ed. by C. L. Mix, 1916); Nelson's *Loose Leaf Medicine*, ed. by W. W. Herrick (1920-).

Medicine Bow Mountains, a range of the Rocky Mountains in Wyoming and Colorado, running as far s.e. as Long's Peak. Elk Moun-tain (11,162 ft.) is its highest peak.

Medicine Hat, city, Canada, in Alberta, on the South Saskatchewan River, 175 m. s.e. of Calgary. It is a railroad division point, and has repair shops, and manufactures of glass, clay, candy, and steel. There are large fields of natural gas in the vicinity; p. 10,310.

Medicine, Progress Since 1935. Medi-

cal progress continues at the pace set by a multitude of investigators, in the clinical and the research fields. The laboratory is assuming greater importance, and such tests as the electrocardiogram, the basal metabolism, and the numerous blood tests are well known. The expense entailed by these examinations has led to the creation of committees on the Costs of Medical Care, who have found that such care might best be handled through the state or the government. The medical profession as a whole, however, favors the present system.

Medicine may be broadly divided into medicine proper (the internal ailments); surgery; pathology; and such specialties as eye, ear, nose, and throat; children's diseases; X-ray; psychiatry.

I. Medicine Proper, includes the study of diseases of the heart, lungs, blood pressure, blood, the internal secretions, the fevers, etc.

By 1942 it was acknowledged that the introduction of the sulfonamide drugs marked the beginning of a new era in medicine. By 1943 a new 'miracle medicine,' penicillin, was being regarded as 'the most effective and curative agent yet discovered.'

1. **Allergy.** This subject has to do with the hypersensitivities to pollens, dust, foods, drugs, etc. These hypersensitivities are observed medically in such conditions as hay-fever, asthma, certain skin eruptions as urticaria (hives), and possibly in migraine headaches and certain intestinal cramps. Certain people are very sensitive to drugs. For instance, phenolphthalein, so common a constituent of many laxatives, may cause a generalized rash and so may phenobarbital. The blood-forming apparatus may also be influenced by drugs (see HEMATOLOGY). The treatment of hay-fever by desensitization with the actual pollen causing the disease continues to be moderately successful. In asthma the results have been less striking despite recent emphasis upon house dusts, foods, etc. A special spray for the administration of adrenalin in asthma has recently been developed; with this, it is possible to vaporize the solution more easily and thus make it more readily available to the constricted bronchial tubercles.

2. **Arthritis.** Most physicians know that chronic arthritis (rheumatism) consists of two main types: the hypertrophic and the atrophic. The hypertrophic does no irreparable harm; it arises from constant use of certain joints; it is prevalent in the elderly. The atrophic cripples, often irreparably; it comes

from nowhere; it strikes the young. We know much of the appearance and but little of the treatment of this disabling disease. The only time-tested treatment which has proven of value is rest and warmth.

3. *Cardiovascular System* (Heart and Blood Vessels).

(a.) *Heart*. In 1935 a new treatment for chronic intractable heart disease by complete removal of the thyroid gland was announced. This gland controls the energy production of the body and with it removed, the heart and all other organs work at a slower pace. The method resulted in some cures of completely bed-ridden cases, but its use is limited to a very few individuals who must be carefully selected.

Coronary thrombosis (plugging of one of the vessels nourishing the heart) appears to be on the increase. The chief advance in its treatment lies in the physician's recognition of the condition. The electrocardiogram helps. Recently, new leads have been introduced in this type of testing and diagnosis made more accurate. In angina pectoris, in which sudden severe heart pain comes in short attacks, advance has been made in drug treatment. Aminophyllin, a drug which dilates small blood-vessels, seems to be of distinct value in preventing attacks.

When the heart has failed and dropsy has developed, digitalis may not always be effective. Certain diuretic drugs which help to drive the excess water out of the system have proved of great value. Among these are salyrgan and mercupurin which are given by injection. Many a long-standing case of heart disease may be kept alive and fairly comfortable with these drugs.

Rarely, the lining of the heart (the pericardium) may become constricted and prevent the heart from beating normally. Surgeons, ever bold, have tackled this problem and in several cases have succeeded, by cutting away adhesions, in curing the condition. No advance in the treatment of valvular disease of the heart has been made.

(b.) *Blood Vessels*. There are certain conditions in which the blood vessels of the extremities become involved either by spasm (Raynaud's disease), by hardening (arteriosclerosis) or by inflammation (Buerger's disease). For spasm, advance has been made by special surgical procedures on the nervous system which controls the blood vessels. No advance has been made in arteriosclerosis. Buerger's disease continues to be treated by various complicated surgical procedures,

which in many cases terminate in amputation.

4. *Endocrinology*. This important field deals with the glands of internal secretion—the adrenals, thyroid, pituitary, ovaries, etc. These glands control all the important functions of the body and make us what we are emotionally, psychically and otherwise.

(a.) *The Pituitary Gland*. This little gland, the size of a pea, in the skull, seems to control or regulate the functions of all the other glands. Up to 1937, at least 16 different functions of this gland had been described. It is intimately concerned with the development of certain unusual cases of obesity. During pregnancy, it produces large quantities of sex hormone which is excreted in the urine. This is the basis of the Ascheim-Zondek test for pregnancy, a test which is almost infallible.

(b.) *The Parathyroid Glands*. These little pea-sized glands are perched on the thyroid gland in the neck and control the proper functioning of calcium and thus of skeletal growth. In the last few years, much advance has been made in the recognition of the disorders of these glands and their improvement by means of surgical removal of abnormal glands.

5. *Gastro-Enterology*. Disorders of the stomach and bowels continue to occupy a large part of medical practice. The esophagus can be minutely examined by the electrically lighted esophagoscope. The gastroscope has recently been introduced for the study of the inner lining of the stomach. By its use, gastritis or inflammation of the stomach has been rescued from the limbo of forgotten diseases. Chronic gastritis is now again becoming recognized as a definite entity. The treatment of ulcer of the stomach and duodenum is satisfactory in most cases with use of a bland diet; certain types of surgery (gastro-enterostomy) have been almost discarded recently, although some surgeons remove large portions of the stomach with impunity and in many cases with benefit to the patient. Mucin has recently been introduced with some success in the treatment of ulcer, but the main factors in treatment continue to be diet, proper mental and physical rest, and avoidance of irritating extraneous circumstances.

6. *Hematology*. Study of the disorders of the blood cells has become one of the most absorbing and important fields of medicine. Advance in this field since the introduction of liver extract for the treatment of a once fatal disease called pernicious anemia has been astounding.

Anemia. Pernicious anemia is now found to be due either to serious dietary deficiency, to chronic stomach disease, to trouble in the bowel or in the liver. The disease is one in which a deficiency of liver substance is present. In its treatment, large quantities of liver are given and in the last few years injectable liver extracts have been developed for more effective treatment. Chlorosis, the "green sickness of the virgins," has given way to another type of disease of middle life seen in women and due to a deficiency in iron. The body becomes depleted of iron because of excess menstruation, too many pregnancies, or insufficient intake of iron in the diet (high iron foods are meat, eggs, green vegetables). Treatment with large doses of iron readily takes care of all the symptoms such as weakness, sore tongue, brittle finger nails, etc. Some cases of anemia require very careful investigation before their cause can be discovered. For accurate diagnosis in the obscure case, the removal of a bit of bone-marrow from the sternum or breast bone has proven of distinct value.

Certain Diagnostic Blood Tests. The count of the white blood cells, examination of the blood smear to determine the types of cells present, and determination of the rate of rapidity (sedimentation rate) with which blood will sink when placed in a glass tube have all been extensively used for the information they give in making a diagnosis and in formulating a prognosis (outlook chart). In tuberculosis, rheumatic fever, and in many other infectious diseases these tests are becoming ever more valuable.

Agranulocytosis. This is a suddenly developing condition in which the mouth and throat become very sore, high fever develops, the white cell count becomes alarmingly low, and death may result. It is a new disease, having been extensively described only since 1930. Its cause in most instances was finally traced to the use of drugs, chiefly amidopyrine (pyramidon) to which certain individuals are extremely sensitive.

7. Deficiency Diseases. In the last few years, great advances have been made in the further elucidation of the role of the vitamins in bodily physiology. These substances are necessary even though their actual quantities are very small. Much has been learned of the disorders caused by a latent deficiency in Vitamin B complex or in Vitamin C. The standard of American living gives us sufficient of the vitamins without being too much concerned with them. However, under cer-

tain conditions of stress as in infection, pregnancy, and post-operatively, an excess vitamin intake may be necessary. The importance of cod liver oil in infant feeding is now a commonplace; only in 1936-1937 was it conclusively demonstrated that the natural cod liver or halibut liver oil is far superior for the prevention of rickets than the synthetic viosterol.

8. Diseases of Metabolism. Diabetes (mellitus) is the prime disorder in this category. The chief advance in this disease has been the introduction of protamine insulin and more recently of protamine zinc insulin. These new insulins have the faculty of maintaining the sugar in the blood at a low level for a much longer interval than the old insulin and in many cases have cut down the dosage of insulin in a given case from 3 to 1 injections a day.

9. Diseases of Kidneys. The diagnosis of kidney disease is accurately made by modern methods: urinary, blood chemical, cystoscopy of the urinary bladder, X-rays of the kidneys and ureters in various ways. Extreme restriction in protein (meat, fish, chicken) intake has been found of no value in Bright's disease. A new chemical—mandelic acid—has been found valuable in the treatment of certain of the urinary infections particularly those due to *Bacillus coli*. A dye—methylene blue—is considered valuable in the treatment of tuberculosis of the kidneys and bladder.

10. Hypertension (High Blood Pressure). The great majority of the cases of high blood pressure disturb psychically rather than otherwise, but there are some very severe cases which are dangerous in themselves and for these, new operative procedures have been utilized in various clinics of the country.

11. Diseases of the Lungs. Tuberculosis is on the wane. Surgeons are making bold advances by their techniques for collapsing diseased lungs. In 1942 encouraging results were reported in the chemical treatment of this disease with two new drugs, promin and di-amino-di-phenyl sulfone. Pneumoconiosis, a disease caused by the inhalation of large quantities of dusts, is recognized as an industrial hazard.

12. Infectious Diseases. *Pneumonia* is still prevalent, though, by 1942, sulphonamide derivatives had reduced the death rate from approximately 33% to 10% in complicated cases. In general, it has displaced routine use of type specific antipneumococcus serum, though serum is indicated in some groups of cases. *Syphilis* is now coming out into the open, thanks to

the courageous efforts of public health officials. Education of the public has led to extreme reduction in the incidence of the disease in the Scandinavian countries and should do the same in this country. *Typhus fever* and related disorders have been studied intensively in this country with the result that recognition is becoming more ready. Zinsser has developed a vaccine which should prove of value where the disease is epidemic. *Polio-myelitis* (infantile paralysis) remains a mysterious scourge. In 1942 the value of treatment developed by Sister Elizabeth Kenny, Australian nurse, was confirmed by medical authority. *Streptococcic diseases* may be helped by a new chemical (prontosil, prontylin) which has been introduced in the past 2 years. These diseases are assuming even greater importance since we recognize their association with rheumatic fever, heart disease of certain types, erysipelas, etc. *Undulant fever* is becoming more widely recognized as more cases are recognized, particularly in those states which do not have stringent laws regulating the pasteurization of milk. For *meningitis* a new antitoxin to be given by vein has been developed.

13. *Cancer*. This is undoubtedly the worst scourge from which mankind now suffers. It seems definitely to be on the increase. Whether this increase is due to the fact that the life span is longer than it was or to other factors in the environment has not been settled. Research in the disease is being made along many fronts. Under intensive study in 1937 were: the metabolism of the cancer cells; the spontaneous cancer of animals; the transmission of cancer from animal to animal; the relation of certain chemicals, principally the tars, to cancer; the relation of heredity; the relation of virus infection to the production of cancer; treatment with high voltage X-rays, radium and other metals. For the present at least, if cancer is to be fought, it should be discovered early and eradicated, usually by surgical methods. Unfortunately, many cancers reside for a long time within the body without offering any suspicious symptoms. Chemical studies in 1942 indicated a definite relationship between cancer and glandular activity; also that certain substances derived from proteins and vitamins might hasten cancer prevention.

14. *X-rays*. The X-rays have become one of the chief tools in the diagnosis and treatment of disease. Every year the X-ray specialist discovers new means of investigating the various crevices of the body. The gall-bladder

and the kidneys can be visualized by certain chemicals injected into the blood stream. The uterus and Fallopian tubes can be seen in outline form by the use of a suitable opaque substance. The blood vessels of the brain and the legs can be beautifully shown with another chemical when suitably injected. The bronchial tubes of the lungs can be distinguished by lipoidal. There seems to be no limit to the possibilities of the X-ray techniques. Even the folds of the lining of the stomach and the actual beating of the heart are not immune to this super-eye.

Treatment by X-rays, particularly with the enormous voltages which have been developed, has improved greatly. Many new techniques (Coutard, spray) have been introduced and are being pursued vigorously.

15. *Psychiatry*. Despite constant study by many groups of investigators, there has been practically no advance either in the understanding or treatment of *dementia praecox*. Recently insulin shock treatment has been advocated; this awaits the test of time. *Psychoanalysis* is being developed by various investigators. Freud's terms are very useful; whether they have any foundation in fact is debatable. The psychoses are being examined more and more from the physiological standpoint and this is gradually giving results. The relation of the sympathetic nervous system to various disorders is becoming manifest and research in the drugs which affect this system is being carried on at great pace. Many psychoses due to underlying organic disease are being singled out with great benefit to the patient. It is sufficient to mention only a few of these (pernicious anemia, myxedema due to lack of thyroid, pellagra due to lack of vitamin B complex).

16. *Diseases of the Skin* (Dermatology). This specialty still suffers from too much classification and too little knowledge of fundamental causes. Many agents which cause skin eruptions are being discovered. The molds (fungi) are being incriminated for certain chronic conditions such as athlete's foot, so prevalent now with the increasing use of gymnasiums and swimming pools. No advance has been made in the treatment of psoriasis or eczema.

17. *Diseases of Children* (Pediatrics). Infant feeding has become a strictly scientific procedure in which all the dietary constituents are carefully scrutinized and given in balanced form. Rickets should soon be a thing of the past. Many of the advances in this field have already been covered in the sec-

tions above, chiefly that relating to the infectious diseases.

II. Surgery

This broad field is divided into many specialties such as obstetrics, nose and throat diseases, etc. Some of the operative fields which the surgeons have boldly attacked have already been mentioned. Chief advances have been made in the surgery of the sympathetic nervous system, the lungs, and the heart. Thoracic surgery has advanced rapidly, so much so that half a lung, even a whole lung is now removed for the cure of cancer of that organ. The mortality rate for such operations is now about 50 per cent., which, although it seems bad on the face of it, is far better than the disease itself or the mortality rate from the operation at its inception. In pulmonary tuberculosis, cavities are being collapsed not only by injection of air (pneumothorax) but by cutting the nerve controlling the diaphragm (phrenicectomy) or by removing a number of ribs (thoracoplasty) thus causing the lung to close in.

Obstetrics. The chief advances in this very old field lie in the development of anesthetic agents to lighten the load of labor. Nowadays, with proper use of sedative drugs, a woman awakens several hours after labor without remembrance of having suffered a single pain. Much discussion has taken place regarding the still high maternal mortality of this country; much of it depends upon the proper safeguarding of the mother through clean and intelligent medical care. Obstetrics, like other fields in medicine, gives best results when slipshod methods are discarded for careful intelligent handling of the patient. The necessity for careful prenatal care has been constantly emphasized—this is important from the standpoint of the development of toxemia, kidney disease and anemia. Much advance is being made in the diagnosis and treatment of sterility. Here the results of research into the glands of internal secretion, X-ray examination of the uterus and tubes have been utilized. By means of proper diets, glandular products, a few surgical procedures and even by 'artificial insemination', many women have conceived who before were barren.

Nose and Throat. Nose and throat specialists seem to be removing fewer septums from the nose as the physiology of the nose is better understood. Chronic sneezers remain a big problem. Success has recently been made in some of these cases by "zinc ionization" of the nasal mucous membrane. The

esophagus (gullet) is being investigated more and more chiefly through the stimulation of Dr. Chevalier Jackson and with the esophagoscope many a safety pin and other foreign body is being removed.

Bones and Joints (Orthopedics). This is an important specialty for the correction of static disturbances of the back, the feet, the legs, etc. and is of greatest value in the after care of infantile paralysis. Recently orthopedists have taken a leaf out of the osteopath's notebook and by means of manipulative (stretching) procedures are relieving certain types of pain chiefly of the neck and arm.

Rectum. The specialist in this small field is called the proctologist. His chief labors are with piles or hemorrhoids. Fissures (cracks) and pruritus (itching) can often be successfully treated by the use of a suitable anesthetic oil given by injection. The 'proctoscope,' an electrically lighted instrument, is used to peer into the rectum and thus reveals ulcers, inflammation, and tumors when present.

Eye. The relationship of night blindness to a deficiency in vitamin A has long been recognized, but its importance in certain cases of poor adaptation to darkness and in traffic accidents occurring at night is just now being appreciated. If the condition is recognized, it is easily cleared up by large doses of cod liver oil.

Medick, a genus of plants of the order Leguminosæ, nearly allied to clover, but distinguished from that and kindred genera by the sickle-shaped, or, in most species, spirally twisted legume. The most important species is Purple Medick, Lucerne, or Alfalfa. (See ALFALFA.)

Medina (Arabic *el medinah*, 'The City,' or *Medinat en Nabi*; 'City of the Prophet'), walled city, Arabia, in the province of Hejaz, situated in the midst of a number of mountain groups; 240 m. n. of Mecca. It is second only to Mecca as the holiest city of the Mohammedan world, being the scene of Mohammed's work after the Hejira, or flight from Mecca (Friday, July 16, A.D. 622). The principal building is the Prophet's Mosque El-Haram ('the Sacred') supposed to be erected on the spot where Mohammed died and to enclose his tomb. Non-Mohammedans are rigidly excluded, as at Mecca. The population is about 30,000. In June, 1916, the grand sherif of Mecca declared his independence of Turkey. In 1925 Ibn Saud came into possession of Mecca and Medina.

Medina Sidonia, city, Spain, in the prov-

ince of Cadiz. Its palace was the ancestral seat of the dukes of Medina Sidonia, who figure largely in the history of Spain from 1445. Pottery is made here; p. 13,500.

Mediterranean Fruit Fly, an insect which in the adult stage resembles the ordinary house fly in size and shape, but is distinguished by glistening black spots on the back, two white bands on the abdomen and black and yellow markings on the wings. It is one of the worst pests known to the citrus fruit industry, its favorite hosts being the orange and grapefruit. In 1929 it made its first appearance in the United States, in Florida, where prompt measures were at once enacted for its control.

Mediterranean Sea, the 'great sea' of the Bible, and the Mare Internum of the Romans, the largest enclosed sea in the world, lies between the continents of Europe, Africa, and Asia. It is connected with the open ocean only by the narrow Strait of Gibraltar, 9 m. wide at the Pillars of Hercules. Since 1869, however, it has been artificially connected with the Red Sea and Indian Ocean by means of the Suez Canal; and it is connected with the Black Sea through the Dardanelles, the Sea of Marmora, and the Bosphorus. The Mediterranean, in a nearly eastern and western direction, is about 2,400 m. in length from the Strait of Gibraltar to the Syrian coast; its width varies from 1,030 m. to less than 100 m. between Sicily and Cape Bon. The total area is estimated at about 900,000 sq. m. The principal rivers draining into it are the Rhone, Po, Danube, Dnieper, Don, and Nile. The chief islands are the Balearic, Sardinia, Corsica, Sicily, Crete, and Cyprus.

The African and Syrian coasts are comparatively even and unindented, the wide gulfs of Gabes and Sidra scarcely presenting an exception; on the other hand, the shores of Europe and Asia Minor are cut up into numerous gulfs and bays, the largest of which is the Adriatic Sea. On the whole northerly winds prevail over the Mediterranean. The temperature of the surface waters may occasionally reach 90°, but is usually much less, the mean of the winter months being between 53° and 57°.

The Mediterranean is not quite tideless, though in no part does the tide rise very high. The countries bordering the Mediterranean have been the cradle of civilization, Egypt, Phœnicia, Greece, and Italy having been successively the homes of knowledge and progress; and at the present time this inland sea is commercially among the most important

waterways of the world. For a discussion of the various questions centering in this region see the articles on the various countries; also **MANDATES**. Consult Ball's *Mediterranean Winter Resorts*; Cook's *The Mediterranean and Its Borderlands* (1910); Newman's *The Mediterranean and Its Problems* (1928).

Medlar, or **Mespilus**, a genus of shrubs or trees of the order Rosaceæ. The fruit is astringent until touched by frost, when it becomes soft, brown, and pleasant in flavor.

Médoc, old district of Guienne, France, situated on the western shore of the estuary of the Gironde. It now forms part of Gironde department, and is famed for its wines.

Medulla Oblongata. See **Brain**.

Medullary Rays, in vegetable physiology, are the radiating cellular bands which, lying between the bundles of the vascular cylinder, connect the cellular tissue of the pith with that of the cortex.

Medusa, in ancient Greek legend, one of the Gorgons. Originally she was a beautiful maiden; but Athena changed her hair into serpents. She then became so hideous that all who saw her were turned into stone. Perseus killed her, and cut off her head, which Athena placed in the center of her shield.

Meerschaum, or **Sepiolite**, a white or yellowish earthy mineral, consisting of hydrous magnesium silicate. It is obtained principally from Eskishehr in Asia Minor. It is used chiefly in the manufacture of tobacco pipes.

Meerut, or **Merath**, chief town in the division and district of the same name, United Provinces, India; 40 m. n.e. of Delhi, with which it is connected by rail. Meerut was the scene of the outbreak of the Mutiny in 1857; p. 123,000.

Megalichthys, a genus of large extinct fossil fishes, also known as *Rhizodus*. The original specimens were found in the Lower Carboniferous strata of Central Scotland, and were described by Agassiz and Hibbert. Consult Dean's *Fishes, Living and Fossil*.

Megalopolis, city of Arcadia in ancient Greece, founded in 371 B.C. It became one of the chief cities of the Achæan League and was the birthplace of Philopœmen and Polybius. Consult *Excavations at Megalopolis*.

Megalosaurus, a large fossil reptile the remains of which have been found in the Combeds, probably Jurassic, of America, and in the Great Oolite of Britain and France. It belongs to the group of dinosaurs.

Megara, town, ancient Greece, in Megaris, just n. of the isthmus of Corinth. It was the

seat of the Megaric school of philosophy.

Megatherium, an extinct fossil edantate of large size, allied to the existing sloths and ant-eaters. It was as large as an elephant.

Megiddo, or **Meggiddo**, ancient fortified city, in the plain of Esdraelon, Palestine, 19 m. s.e. of Nazareth. Solomon restored the fortifications.

Meiklejohn, Alexander (1872-), Am. educator, born Rochdale, Eng.; ed. at Brown and Cornell; dean of Brown (1901-12); pres. of Amherst Col. (1912-24); prof. at U. of Wis. (1926-33); St. John's (1940-).

Meissonier, Jean Louis Ernest (1815-91), the most famous 'small master' of the modern French school of painting. About seventy-five of his smaller paintings are owned in the U. S.

Meistersingers, or **Meistersänger**, German minstrels of the artisan class who formed themselves into guilds in order to revive the national minstrelsy.

Mekinez, or **Miknes**, tn., Morocco, contains the summer residence of the sultan and the Mulai Ismael mosque. Leather and earthenware are manufactured; p. 37,000.

Mekong, sometimes given as **Cambodia R.**, the principal artery of Indo-China, 2,800 miles long, has its source in Tibet, and eventually divides into two great arms, the upper one of which discharges into the China Sea by five mouths, while the lower reaches the sea by the Kua-Bassac estuary.

Melampus, in ancient Greek legend, the first mortal who acquired prophetic powers. He cured the daughters of Prætus, king of Argos, of madness.

Melancholia, a form of insanity in which the patient loses interest in his surroundings, and becomes morbidly self-absorbed. He may be pursued by fear of social or financial ruin, or of eternal wrath in the world to come. In a classification of mental diseases this form is included under manic-depressive insanity.

Melanchthon, Philip (1497-1560), German reformer. After Luther's death, by common consent he became leader of the Lutherans. His most popular publication was *Loci Communes Rerum Theologicarum* (1521).

Melanesia, islands in Pacific Ocean, n.e. of Australia, so-called from dark color of natives. They include the Solomon, Santa Cruz, and New Hebrides Archipelagoes; the Loyalty group, New Caledonia, and the Fiji Islands.

Melanite, a black variety of garnet.

Melba, Dame Nellie (1861-1931), Aus-

tralian prima donna, born Helen Porter Mitchell, in Melbourne, was one of the world's greatest singers. She sang at Covent Garden in 1888. Her first appearance in the United States was in 1893. She sang in concert for some years, and was with the Chicago Opera Company in 1917. After 1918 she taught in her native city.



Dame Nellie Melba

Melbourne, city, capital of Victoria, Australia. It is the second largest city in Australia, and an important railway and commercial center. The city is well laid out, with broad, well lighted streets and many public parks and gardens. The port of Melbourne is 2½ miles distant. There are dry docks at Melbourne and a graving dock at Williamstown, on the opposite side of Hobson's Bay. A large share of Australia's commerce passes through Melbourne, the leading exports being frozen meat, wool, dairy products, fruit, wine, and grain. Flour, bricks, soap, boots, clothing, woolen goods, and leather are manufactured. Melbourne was settled in 1835. The first Federal Parliament of the Australian Commonwealth met in Melbourne in 1901, and the city was the capital of the Commonwealth until 1927; p. 1,018,000.

Melbourne, William Lamb, Second Viscount (1779-1848), English statesman, is remembered chiefly for his kindly devotion to the young queen, Victoria, who ascended the throne during his premiership (1837).

Melchites, a name originally given to the Egyptian orthodox Christians in the fifth century, now denoting the Christians of Syria, Palestine, and Egypt, who employ the Greek rites, but hold the doctrines and ac-

knowledge the supremacy of the church of Rome.

Melchizedek, according to Gen., king of Salem and priest of the most high God. He gave a blessing to and received tithes from Abraham while the latter was returning from his victory over Chedorlaomer.

Meleager, in Greek legend the son of Ceneus and Althea. He was a member of the Argonautic expedition and the hero of the Calydonian boar hunt.

Melia, a genus of low, tropical trees. The best known species is the Pride of China (or of India) tree, which has become nat-

rocky peninsula ending in Cape Tres Forcas.

Melilotus, commonly known as **Sweet Clover**, a genus of clover-like plants. There are about twenty species widely distributed. The White Melilot is much the commonest variety. It is useful as a leguminous plant for ploughing under; and in heavy soils it is grown for the sake of its roots, which, in decaying, leave drainage canals perforating the soil. It is also an excellent bee-plant, and is common along roadsides.

Melinite, a high explosive, used in the French military service as a bursting-charge for shells.



Melbourne, Australia.

uralized in the Southern United States. It is a favorite shade tree, and has a variety of names, such as 'china berry,' or 'bead tree,' the latter referring to the habit of Eastern monks, of stringing the brown nuts as rosaries. It rarely exceeds fifty ft. in height and develops a wide spreading, dome-like head of exaggerated form in one variety, where the drooping branches suggest the name of 'umbrella tree.'

Melilite, or **Honey Stone**, a component of certain igneous rocks formed from magmas low in silica and rich in lime and alumina. It is white, pale yellow, or greenish in color.

Melilla, fortified seaport, Morocco, on a

Mellen, Charles Sanger (1851-1927), American railroad official, was associated with the New York, New Haven, and Hartford Railroad Company, and Boston and Maine Railroad.

Mellon, Andrew William (1855-1937), American financier and public official, was born in Pittsburgh, Pa. He was Secretary of the Treasury, 1921-1932. He was Ambassador to Great Britain in 1932-33. At the beginning of 1937, Mr. Mellon donated to the United States Government his collection of paintings by old masters, valued at \$19,000,000, and the sum of \$8,000,000 for the erection of a National Gallery of Art. There are about seventy paintings in the collection.

Among Mr. Mellon's stipulations were the following: that additions to the collection shall meet a high standard; that the building in which they are housed, to be designed by John Russell Pope, shall be erected on the Mall near the Smithsonian Institution; that it shall not bear the Mellon name; that the

Mellon Institute of Industrial Research. See **Pittsburgh, University of.**

Melodeon, a musical instrument with a keyboard, which was superseded by the American organ. The name is also applied to an improved variety of the accordion.

Melodrama, strictly speaking denotes a



Melrose Abbey.

Smithsonian Institution shall supervise the project; and that Congress shall provide for the upkeep of the building. For one of the

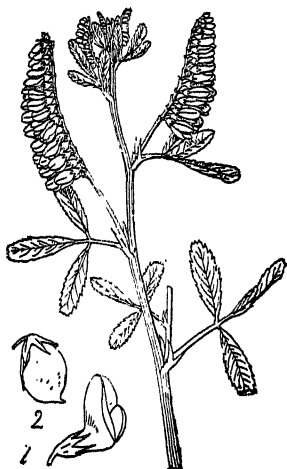
half-musical drama, or that kind of dramatic performance in which declamation is interrupted from time to time by instrumental music. The name, however, has come to designate a romantic play, depending mainly on sensational incidents, thrilling situations, and an effective dénouement. See **DRAMA.**

Melon, the fruit of either watermelon or muskmelon, both members of the gourd family.

Melpomene, the tragic muse. See **Muses.**

Melrose, town, Scotland, on the Tweed. It is the center of the district associated with Sir Walter Scott. It is chiefly noted for its abbey, probably the finest ruin in Scotland. Melrose is a summer resort; p. 4,518.

Melting is the change of physical state that takes place when a solid becomes a liquid under the influence of heat, and indicates an increase of molecular mobility. For any given substance that can be sufficiently heated without undergoing chemical decomposition, the temperature at which it occurs is a fixed one, and the change takes place sharply. Melting points are but little affected by pressure; very great pressures, however, slightly lower the temperature of fusion of substances that solidify with expansion, and conversely.



Melilotus officinalis.

1, Flower; 2, fruit.

pictures in the collection, Raphael's *Madonna of the House of Alba*, Mr. Mellon paid the Soviet Government \$1,166,400.

Melton Mowbray, town, England. The church of St. Mary is one of the finest in England.

Meltzer, Charles Henry (1853-1936), journalist and dramatist, born in England, of Russian parents, was for several years dramatic and music critic of the *Herald*, and dramatic reviewer on the *World*.

Melville, Herman (1819-91), American author. In 1841 he shipped in a whaler. After ill-treatment, he escaped to an island in the Marquesas group and passed four months among the savages of the Typee valley, his

tin, Canada. It is 250 m. long, with an average breadth of about 100 m.

Melville Sound, eastern Canada, about 250 miles long and 200 miles broad, extends southeast of Melville Island, and communicates with the Arctic Ocean, and with Baffin Bay.

Membrane, a texture of the animal body which covers organs, lines the interior of cavities, and enters into the formation of walls of canals and tubes.

Memel, seaport town of E. Prussia, was included in territory ceded by Germany to



Statue of Rameses at Memphis.

romantic experiences being recorded in his first book, *Typee* (1846). Subsequent books: *Moby Dick, or the White Whale* (1851),



Mendelssohn-Bartholdy.

Battlepieces (1866), *The Piazza Tales* (1856).

Melville Peninsula, a peninsula projecting from the northeastern corner of Keewa-

Lithuania (1919). It has an excellent harbor, is a center of the Baltic trade in timber, and exports corn, hemp, flax, linseed, pitch, and tar. Soap, cellulose, and chemicals are manufactured and there are sawmills, iron foundries, breweries, and shipbuilding yards; p. 36,000. Territory of 1,100 sq.m. including Memel was taken by Germany, 1939.

Memlin, or **Memling**, **Hans** (c. 1430-94), Flemish painter. He ranks among the purists of Flanders, and used the oil methods of the Van Eycks. His works include *Shrine of St. Ursula*, *Adoration*, and *The Last Judgment*.

Memnon, in ancient Greek legend, son of Tithonus and Eos, who helped the Trojans against the Greeks after Hector's death; killed Nestor's son, Antilochus; and was himself killed by Achilles.

Memorial Day. See **Decoration Day**.

Memory, sometimes used as equivalent to mental retentiveness in general, is, as a rule, used in the more limited sense of the 'mental revival of conscious experience' (Baldwin). The power of retention is a primitive endowment of the nervous system, and varies greatly in individuals. The physical problem

of memory is neither more nor less than the physical problem of the original impression or perception—the nervous impression being accompanied by consciousness at the time of perception, and the memory being accompanied by similar consciousness at the time of revival along the same nerve tracts. By memory there is thus formed a physical record of experiences. The revival of nerve energies along the path of the original impressions is the physical concomitant of memory.

Memphis, ancient capital of Egypt, on the left bank of the Nile, 12 miles s. of Cairo. It is reputed to have been founded by Menes, c. 4000 B.C. The pyramids are near here. By the nineteenth century nearly all traces of it had disappeared. Two colossal statues of **Rameses II.** remain.

Memphis, city and port of entry, Tennessee, co. seat of Shelby co., the largest city in the State, and the most important on the Mississippi River between St. Louis and New Orleans. It is situated at the head of deep-water navigation. Two large cantilever railroad bridges cross the Mississippi here. Memphis is splendidly situated on Chickasaw Bluffs, 4 ft. above high water. It has broad, shaded, well paved streets; 1,200 acres in improved parks; and, on three sides of the city, a fine parkway system, the most extensive in the south. Memphis is one of the largest inland cotton markets and the greatest hardwood lumber producing market in the world. Industries include: Chemicals, furniture, patent medicine, toilet articles, automobile bodies, cottonseed oil; p. 292,942.

Memphremagog Lake, a body of water in the prov. of Quebec and the State of Vermont, about 30 miles long and from 2 to 5 miles wide.

Menam, chief river in Siam, about 800 m. long. It is the great Siamese highway of trade.

Menander (342-291 B.C.), poet of the New Comedy at Athens. As a playwright, Menander was praised for his truth to life and for his pathos.

Mencius, Latinized form of **Mêng-Tse** (372-288 B.C.), Chinese sage, born in Shantung.

Mencken, Henry Louis (1880-), American editor and critic, long connected with the *Baltimore Sun*. His chief editorial work was with the *American Mercury*, 1924-1933. His published works include sociological and critical essays; *The American Language* (rev. ed. 1921); *Happy Days* (1940); *A New Dictionary of Quotations* (1942).

Mendeléeff, Dmitri Ivanovitch (1834-1907), Russian chemist. The work with which his name is most connected is his enunciation of the periodic law of atomic weights.

Mendel's Law, or **Mendelism**, a term used to designate certain principles of heredity enunciated in 1865 by Mendel (1822-84), abbot of Brünn. Mendel's experiments were carried out on different forms of garden peas. He chose forms which are known to be constant from generation to generation. Taking two forms, A, or yellow-flowered, and B, or white-flowered, which differ from one another in color only, he crossed them, and so produced a set of hybrid offspring. All the offspring were yellow. As the result of crossing the hybrid forms produced by his first operation, he concluded that there are three possible types of union which may occur. (1) Sex-cells of type A may unite with type A, producing pure forms; (2) sex-cells of type B may unite with type B, producing another series of pure forms; or (3) sex-cells of type A may unite with those of type B, producing a series of hybrid forms. Further, on the doctrine of chance, these hybrid forms will tend to be twice as numerous as either of the pure forms, so that in 100 fertilizations there will tend to be 25 A's, 25 B's, and 50 AB's. The hybrid or AB forms of the second generation are entirely comparable, both as regards the character of their germ-cells and as regards their body or somatic characters, to the hybrids of the first generation. See **HEREDITY**.

Mendelssohn, Moses (1729-86), Jewish philosopher and author, was born at Dessau, on the Elbe. Perhaps his greatest work is the *Phædon* (1767), a Platonic dialogue on the immortality of the soul. Of great importance from a social point of view is his *Jerusalem* (1783), in which he discusses questions of religion and toleration, and demands complete separation of church and state.

Mendelssohn-Bartholdy, Jakob Ludwig Felix (1809-47), German musical composer. He appeared in public as a pianist before his twelfth year, and in his seventeenth composed the *Midsummer Night's Dream* overture (1826). His symphonies, overtures, and other orchestral compositions; his concertos, sonatas, capriccios, and *Songs without Words*, for piano; also his octets, quintets, quartets, trios, and other examples of chamber music—are all regarded as standard works. In oratorio he is perhaps the greatest rival of Handel.

Mendieta, Dr. Carlos (1873-), Cu-

ban politician and revolutionist, became president of the republic in January, 1934, succeeding the forty-hour administration of Carlos Hevia, one of several chief executives who tried to stabilize the country after the overthrow of President Machado. Mendieta strengthened the national authority, and Cuba had a respite from the long period of disorder.

Mendocino, Cape, the extreme western point of California. It has a lighthouse with a light of the first order, 422 ft. above mean high water.

Mendoza, city, Argentine Republic, capital of the prov. of Mendoza; beautifully situated at an altitude 1,500 ft. above the plains. The chief industries are wine making and the bottling of mineral water; p. 58,790.

Menelaus, in ancient Greek legend, the successful suitor for the peerless Helen. He was king of Sparta, and there entertained the Trojan prince Paris, who during his absence persuaded Helen to leave her husband and accompany him to Troy. Hence arose the Trojan War.

Menelik II., (1844-1913), emperor of Abyssinia, claimed direct descent from King Solomon and the Queen of Sheba. Menelik II. was one of the most remarkable men of his race; a wise and just ruler, who did much to improve his country, encourage commerce and agriculture and to establish friendly relations with foreign powers.

Menendez y Pelayo, Marcelino (1856-1912), Spanish critic and bibliographer. Menendez y Pelayo was probably the greatest Spanish critic of the century. His principal works include *Los Heterodoxos Españoles* (1880); *La Ciencia Española* (controversial essays, 1887-89); *Antología de los Poetas Castellanos* (1890); *Estudios de Critica Literaria* (1887-95); *Orígenes de la Novela* (1905-10).

Menes, reputed to be the first historical ruler of all Egypt about 4500 or 4000 B.C.

Mengelberg, Willem (1871-), Dutch musical conductor, has been guest conductor in Italy, Russia and the United States; and since 1929 conductor in Amsterdam.

Menhaden, Mossbunker or Pogy, an American fish closely related to the herring and shad, common on the Atlantic coasts of the United States. It is about 12 to 15 inches long, greenish brown and iridescent in color.

Menhir, in archæology, the name given in Brittany to the rude, unhewn upright stones found there, as well as in the British Isles, and in many other parts of the world.

Menin (Flem. *Meenen*), town, Belgium. It

has manufactures of cotton and linen tissues, gutta percha goods, and soap, and bleaching, brewing, and tanning works. Flax and tobacco are cultivated.

Meningitis, an inflammation of the membranes of the brain and spinal cord, due to a variety of causes. Blows, injuries to the skull, and specific infections are ordinary means of exciting meningeal inflammation, which may either be distinctly localized or widespread. Extensive and severe meningitis may also follow sunstroke, and the disease occasionally breaks out in an epidemic form known as epidemic cerebro-spinal meningitis. The symptoms depend on the situation and extent of the inflammatory process. The diagnosis is often extremely difficult, and in all cases the prognosis is grave. Ice to the head or spine and counter-irritation are sometimes useful. Absolute rest and maintenance of the patient's strength are essential, while any condition, such as aural disease, which has been the source of the affection, must be treated in the most energetic manner.

Mennonites, a Christian sect organized in 1525, at Zürich in Switzerland and known by the name of Swiss Brethren. The movement sprang from a feeling that the then existing union of church and state and the resultant religious tyranny were unscriptural. The name by which this sect is known today is taken from Menno Simons (1496-1561) who had been a Catholic priest in Friesland. The Mennonite doctrine of baptism, which they administer (usually by pouring) only on confession of faith, and their principle of non-resistance are distinctive. The Sacrament of the Lord's Supper is generally celebrated semi-annually. It is in a number of branches preceded or followed by the ordinance of foot washing. The Mennonites refuse to take oaths, and some branches, except in connection with school management, object to filling state or civic offices.

The first permanent Mennonite settlement in America was made in Pennsylvania in 1683; the first church was built in Germantown. The total of Mennonites in the United States being from 85,000 to 90,000. About 17,000 are in Canada. Consult Menno's *Complete Works*; Heatwole's *Mennonite Handbook of Information* (1925).

Menno Simons (1492-1559), religious leader, from whom the Mennonites derive their name, was born in Witmarsum, Friesland. He severed his connection with the Roman Catholic Church, was rebaptized, affiliated himself with the more conservative

branch of the Anabaptists, and established a press near Oldesloe, in Holstein, for the diffusion of his religious teachings.

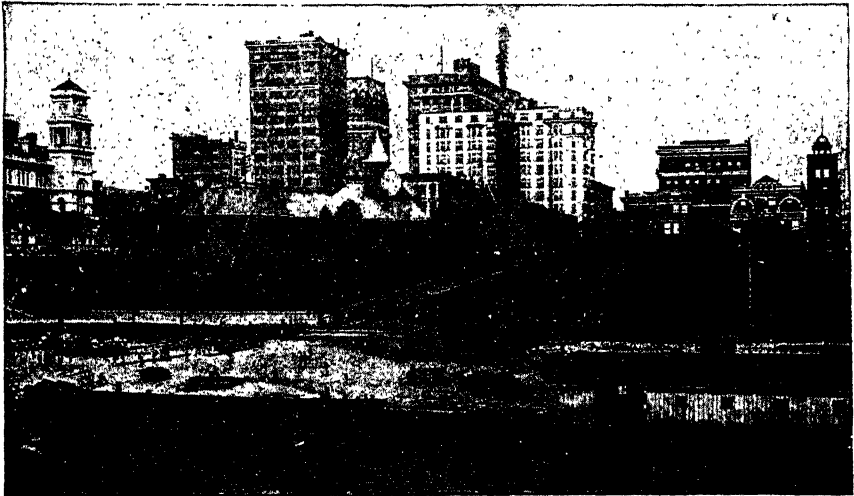
Menocal, Mario G. (1867-1941), Cuban general and political leader. President of Cuba, 1913-1921.

Menominee, a North American Indian tribe of Algonquin stock, who formerly ranged over Wisconsin and Michigan. They have a distinct language, but otherwise resemble the Ojibways. They now number about 1,600, of whom 1,350 live on the reservation near Green Bay, Wis.

Menopome, an amphibian found in the rivers of North America. It resembles the salamander in form, may reach a length of two ft., and is grayish in color, spotted with black. It is known as the 'Mud Devil,' 'Hell Bender,' or 'Water Dog.'

Mensa, a small constellation between Dorado and the South Pole, and named *Mons Mensæ* from Table Mountain at the Cape.

Menshikoff, Alexander Danilovitch (c. 1672-1729), Russian field marshal and statesman. After death of Peter the Great (1725) he secured the throne for Catherine, and dur-



Memphis, Tennessee: The Mississippi River Front.

Menominee, city, Michigan, on Green Bay, is a prominent lumber shipping port, and has manufactures of shingles and boxes, wire, steel, electrical and mining machinery, paper, beet sugar, shoes, furniture and chemicals; p. 10,230.

Menopause, Climacteric, or Change of Life, the time when, in the human female, the activities of the ovaries finally cease. It occurs, as a rule, from forty-five to fifty years of age. It is characterized by marked irregularity of the menstrual periods, and sometimes, in poor health, by flushings of the skin, giddiness, and many other manifestations of nervous irritability. The anatomical characters of the menopause are a shrinkage and atrophy of the ovaries, fallopian tubes, and uterus. In some cases the change is abrupt; more frequently the catamenia are irregular for many months.

ing her reign was the real ruler of Russia.

Menstruation, the Monthly Period, or Catamenia, a periodic discharge of a sanguineous fluid from the non-pregnant uterus, due to the shedding of the lining membrane of the uterus, and usually associated with the separation of an ovum from the ovary. This periodic discharge occurs between the ages of puberty, 13-15 in temperate climates, and the climacteric, though the onset and duration are subject to considerable variations. It occurs earlier in the inhabitants of hot climates. It becomes irregular about the forty-fifth year, and has usually ceased by the fiftieth year. Menstruation usually occurs every twenty-eighth day, and lasts from three to six days. Disorders of menstruation arise from an impairment of the general health, from an alteration in the position or structure of the womb, or from mental sug-

gestion, the latter being the most probable cause of suffering in a natural function which is without any discomfort in a normal person.

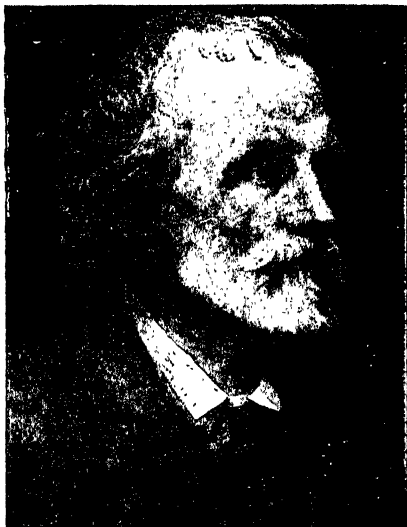
Mensuration, the name of that branch of the application of arithmetic to geometry which teaches, from the actual measurement of certain lines of a figure, how to find, by

solid we have only to measure certain of its boundary lines or *dimensions*; and from them we can calculate or infer the contents. Mechanical methods have been devised for the calculation of irregular lengths and areas, and curves whose equations are known are best treated by the calculus.



Photo by Ewing Galloway, N. Y.

The Mer de Glace, Chamonix.



George Meredith. (From a Portrait by G. F. Watts, R.A.; photo by Hollyer.)

calculation, the area of surfaces, and the volume of solids. In measuring a surface or a

Mental Deficiency, the condition of a person who, by reason of inheritance, disease, or injury, suffers from birth or at an early age from arrested development of mind, and is therefore incapable, to a greater or less extent, of managing his affairs with ordinary prudence. There are different degrees of mental deficiency. At the one extreme there is the pronounced and degraded type to whom the term 'idiot' is popularly applied; at the other we have the 'feeble minded,' who, by reason of mental or physical defect, are incapable of receiving proper benefit from the instruction in the ordinary elementary schools. The height and weight of mentally defective children are less than normal, the skin is coarse, the teeth are incomplete in number and poorly developed, the muscular system shows lack of tone, the bones are imperfectly developed, and the sexual organs are notably arrested in their development. Changes in the shape and configuration of the head are common. See **HYGIENE**.

Menthe, or **Crème de Menthe**, a liqueur, of which two varieties, a green and a white, are sold. Both should be prepared from the

finest grape alcohol flavored with menthol.

Menthol, or **Peppermint Camphor**, is obtained from the common plant *Mentha piperita*, and from *Mentha arvensis*, found in Japan. In neuralgia, toothache, headache, etc., menthol sometimes gives instant relief. Menthol has also antiseptic properties, and is used in solution in diphtheria, etc.

Mentone, (French *Menton*), town, France, on the Mediterranean. It is a popular winter resort of the Riviera; p. 22,600.

Mentor, the son of Alcmus, and trusted friend of Ulysses. By him the young Telemachus was educated, and his name has become a synonym for an instructor and guide.

Menuhin, Yehudi (1916-), American violinist, was born in N. Y. City. At the age of 7 he was soloist with the San Francisco Orchestra, and at 8 gave a recital at the Manhattan Opera House. Through his interest in research, he has introduced many 'lost' works of the masters.

Menyanthes, a genus of hardy aquatic plants belonging to the order Gentianaceæ. One species is the Buck Bean or Bog Bean.

Menzaleh, Lake, lagoon, Lower Egypt, 30 miles long, with average breadth of 20 miles. It lies between the Damietta branch of the Nile and the Suez Canal, which traverses it, and is separated from the Mediterranean by a narrow strip of land.

Menzel, Adolf von (1815-1905), German painter. His *Iron Mill*, *Adam and Eve*, *Christ among the Doctors*, and *Christ Expelling the Money Changers* are notable pictures.

Mephistopheles, one of the best-known personifications of the principle of evil. Mephistopheles owes all his modern vitality to Goethe's *Faust*. Goethe allowed him no attractive quality, but made him a sneering cynic, the embodiment of all that is worst in man's intellectual nature.

Mercadante, Saverio (1797-1870), Italian operatic composer. In 1818 he produced the first of some sixty operas, which include *I Briganti* (1836); *Il Giuramento* (1837); *La Vestale* (1842).

Mercantile Agency, or **Commercial Agency**, an organization which undertakes to collect information as to the financial standing and responsibility of individuals, firms, and corporations engaged in business, and to furnish such information to its patrons. In the United States, Bradstreet's and Dun's have perhaps achieved the greatest success. Subscribers to a commercial agency are entitled to a confidential printed record of all business houses rated, or of all concerns

in a given line of business, as well as to more detailed information in regard to a particular house, furnished on request.

Mercantile Law, or **Commercial Law**, is used rather vaguely for the body of law which relates to commerce. Its main rules and principles are the same throughout the commercial world, due allowance being made for minor and local differences. It embraces such titles as principal and agent, carriage by land and sea, insurance, brokerage, guarantee, the laws of shipping, etc.

Mercantile Marine. See **Shipbuilding**; **Shipping**, **Merchant**.

Mercantile System, or **Mercantilism**, that system in political economy which regards it as a government's chief end to secure a favorable balance of trade—to get the country to import as little as possible of the produce of other countries, and export as much as possible of its own.

Mercaptans, or **Thioalcohols**, a group of organic compounds which are inflammable liquids and all possess a repulsive, garlic-like odor. In contact with metallic oxides they form mercaptides and water.

Mercator, Gerardus, whose real name was Gerhard Kremer (1512-94). His chief work was his great *Atlas* (1585-1602). He gained lasting fame by the invention of the Mercator Projection, on which all marine charts are drawn, as well as many maps of the world.

Mercator's Projection. See **Projection**.

Merced River, California, traverses the Yosemite Valley for 8 miles, descending 2,000 ft. in 2 miles, and later falling in two vertical cataracts of 600 and 350 ft.

Mercenaries, a term generally restricted to professional soldiers who are aliens to the state which they serve for hire. The decadence of the Roman empire was largely due to the substitution of foreign mercenaries for the Roman legions. Hessian mercenaries were employed by Great Britain in the American Revolution. See **CONDOTTIERI**; **SWISS GUARDS**.

Mercer, Henry Chapman (1856-1930), American anthropologist. He explored the caverns of Yucatan, and devised new designs and methods in the manufacture of mural tiles and fabrics. He has published the results of his work.

Mercerization, a process of treating cotton discovered by John Mercer, an English chemist, and patented in 1850. The cotton is so treated that the threads of both warp and weft shrink, making the fabric closer and stronger. Long after Mercer's death it was

discovered that if cotton be mercerized while under tension, so that it cannot contract, it takes on a high gloss, which in the case of long staple cottons is similar to that of silk.

Mercer University, an institution under Baptist control, founded in 1833 at Mercer Institute, near Greensboro, N. C., and removed to Macon, Ga., in 1871.

Mercié, Antonin (1845-1916), French sculptor, won the Prix de Rome (1868). His statue of Napoleon on the Vendôme Column is one of his most famous works.

Mercier, Desiré Joseph (1851-1926), Belgian cardinal. After the German invasion of Belgium (1914), Cardinal Mercier issued pastoral letters in which he exhorted the Belgians to defend their rights, and condemned the Germans for their wanton violation of those rights.

Mercur, James (1842-96), American military engineer. He engaged from time to time in various projects for river and harbor improvements, notably at Hell Gate (1876-81) and at Charleston Harbor (1878-81).

Mercurius, in Roman mythology, the god of commerce and traffic generally; he was identified with the Greek Hermes.

Mercury, the smallest primary planet and the one nearest the sun, revolves at a mean distance from the latter of 35,700,000 miles in a period of 88 days. The periods of rotation and revolution are identical; hence the planet turns, apart from the effects of libration, always the same face towards the sun. The phases of Mercury and Venus correspond to those of the moon. The diameter of Mercury is 2,770 miles; it can only be seen after sunset or before sunrise, when it shines as a dull white star brighter than Arcturus.

Mercury, or **Quicksilver** (Hg, 200.0), is a metallic element that is liquid at ordinary temperatures. It occurs free in nature to a small extent, but its chief source is its sulphide, cinnabar, HgS. The chief producing countries of the world are Spain and the United States, where California and Texas furnish the whole amount. Large quantities are also obtained in Austria-Hungary, Russia, Mexico, and Italy. Mercury is a very heavy (sp. gr. 13.6), silver-white, shining liquid that solidifies to a malleable solid at -40° C., and boils to a colorless vapor at 358° C. It is a fair conductor of heat and electricity, and has a regular coefficient of expansion. Mercury readily dissolves most metals, forming amalgams with them. It tarnishes but slightly in the air, except when heated to about its boiling point, when it is slowly converted

into its oxide, a red powder, from which oxygen is again set free at a higher temperature.

Mercury forms two classes of salts. 1. Mercuric, of which the most important is *mercuric chloride*, or *corrosive sublimate*. 2. Mercurous, of which *mercurous chloride*, or *calomel*, is typical. Mercury is invaluable for scientific purposes, chiefly on account of its high density and high boiling point, and as conducting electricity without undergoing change. Hence it is employed in barometers, manometers, pumps for attaining high vacua, thermometers, electrical connections and switches, and for a host of other products. It is also used, largely as a solvent in extracting gold, for silvering mirrors, and both free and in combination as a drug. In medicine, mercury in mercuric and mercurous chlorides and iodides, and many other preparations of the metal, is largely used. Perhaps the most valuable application of mercury is in the treatment of syphilis, for which disease the drug is a direct antidote. Workers with mercury are often affected with nervous troubles, exhibited by trembling and palsy.

Mercury, Dog's, the popular name of a poisonous herbaceous plant which is a native of the temperate parts of Europe and Africa.

Mercy, Fathers of, a charitable and missionary society composed of Roman Catholic priests, founded in France in 1814, and introduced into the United States in 1839.

Mercy, Sisters of, members of the Roman Catholic Order of Our Lady of Mercy, founded in Dublin in 1827, and of other religious communities, who have taken the vows of poverty, celibacy, and obedience, and who devote their lives to works of charity.

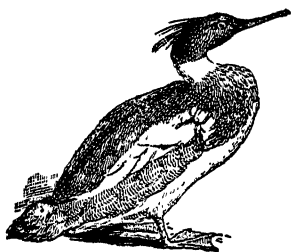
Mer de Glace, much-visited Alpine glacier, 16 sq. miles in area, and 9 miles in length, on the n. slope of the Mont Blanc range, above the valley of Chamonix. Its flow in summer and autumn is said to be two ft. per day.

Meredith, George (1828-1909), English poet and novelist. He was sent to the Moravian school at Neuwied, in Germany. In his sixteenth year he returned to England. The successful period of Meredith's life dates from *Beauchamp's Career*, 1875. In 1879 was published his great novel *The Egoist*, which shares with *The Ordeal of Richard Feverel*, 1859, the highest praise his work has received. In 1884 *Diana of the Crossways*, his most popular novel with less critical readers, appeared. See his *Complete Works* (1896-8).

Among the most useful critical works on Meredith are: *George Meredith: Some Characteristics*, by Richard le Gallienne, with a bibliography by John Lane (1900); *George Meredith: Some Early Appreciations*, selected by Maurice Buxton Forman (1909).

Meredith, Owen. See **Lytton**.

Merganser, a sca-duck of the genus *Merganser*. The most widely distributed species is the red-breasted merganser which breeds throughout the northern parts of the Northern Hemisphere. It is a handsome bird, with



Merganser.

a glossy green head, long, filamentous crest, white neck with a black band, and reddish breast streaked with black, while the back and upper surface are chiefly black with white markings. The female is more soberly clad. The American merganser has no crest or band of streaks on the breast; it breeds commonly in Canada.

Merger, in the law of real property, is the extinguishment of a lesser estate by the acquisition of a greater estate in the same land by the owner of the former, or *vice versé*.

Mergui. 1. **M. Archipelago**, group of rocky islands in Bay of Bengal, off coast of Tenasserim, Burma. They are peopled by Silongs, whose chief occupations are pearl-fishing and the collection of *bêche de mer* and edible birds' nests. 2. Seaport of Lower Burma, on an island about 2 miles from the mouth of the river Tenasserim. Exports timber and rice; p. 15,000.

Mérida. 1. City, Mex., cap. of Yucatan. It has many good stone buildings and a cathedral dating from 1598. The manufactures are rope, straw, hats, soap, candles, leather, cigars, and brandy; p. 63,000. 2. Tn., Venezuela. The manufactures are woolen goods, candles, leather, etc.; p. about 14,000.

Meriden, city, New Haven co., Conn. The leading industry is the manufacture of sterling silver and silver plated ware, hardware, cut glass, fire-arms, lamps, gas and electric

fixtures, clocks, etc. Hubbard Park, 900 acres, contains the 'Hanging Hills of Meriden,' a curious formation with jagged cliffs of trap rising from a plain; p. 39,494.

Meridian, city, Miss. It has machine shops, railroad shops, lumber mills, grist mills, foundries, manufactories of sash and blinds, coffins, wagons, and furniture, cotton and cotton-seed oil mills, fertilizer works, etc.; p. 35,481.

Meridian, Celestial, a great circle of the heavens marking the intersection of the plane of the terrestrial meridian with the sphere. It may also be described as a vertical circle passing n. and s. through the poles, or as the hour-circle crossing the zenith.

Mérimée, Prosper (1803-70), French novelist and historian. His first works, *Clara Gazul* and *La Guzla* (1825), purported to be translations, respectively, of Spanish comedies and Illyrian songs. The former he never surpassed. *La Chronique du Règne de Charles IX.* (1829) was his most famous historical novel.

Merington, Marguerite, English-American dramatist. Her first publicly produced play, *Captain Letterblair*, was written for E. H. Sothorn at his suggestion, was given in 1891. Other plays are *Love Finds the Way*, produced by Mrs. Fiske (1898), and *Scarlett of the Mounted* (1906).

Merino, a Spanish breed of sheep, prized especially for the quality of the wool. See **SHEEP**.

Merionethshire, maritime co. of N. Wales. It is very mountainous, with picturesque valleys. Slate, limestone, gold, copper, and lead are obtained. Festiniog is the largest town; p. 45,573.

Merivale, Herman Charles (1839-1906), English author. He published poems and plays, of which the principal are *The Cynic* (1882), *Fedora* (1883), *Our Joan* (1885), *The Butler* (1886), *The Don* (1888), and edited the *Annual Register* (1870-80).

Meriwether, Lee (1862-), American social reformer. He served in various governmental commissions for the study of labor conditions, prison administration, and business organization. In addition to numerous reports he has published: *A Tramp Trip: How to See Europe on 50 Cents a Day* (1887); and *The Tramp at Home* (1890), *The Journal of Lee Meriwether*.

Merlin, the smallest of British falcons, which preys chiefly on small song birds and is used in falconry.

Merlin, the wizard of Arthurian romance,

was of Welsh origin and mystic birth, and played a part at the court of Vortigern, and a still more important part at that of King Arthur. From the 12th century onwards he was famous as the reputed author of prophecies concerning the destinies of England. Merlin figures, of course, in Malory's *Le Morte d'Arthur* and in Tennyson's *Idylls of the King*.

Mermaids and Mermen, pictured with the upper half of the body quite human, while the lower half is that of a fish. Similar figures, male and female, occur again and again in ancient, mediæval, and later art. This curious belief may be explained as a personifying of the power of the sea. Many stories of sea-women and sea-men resolve themselves into descriptions of a race like the Eskimos, who, when in their skin kayaks, appeared to early voyagers like seals standing breast-high out of the water.

Mermaid's Purse, the name commonly given to the purse-shaped capsules enclosing the eggs of skates, dog-fish, and their allies. The young skate splits open the purse when its development is completed, and the empty horny purses are often thrown up by the waves.

Mermaid Tavern was situated in Bread Street, Cheapside, London. It is mentioned in *Expenses of Sir John Howard* (1464). Here Raleigh founded the famous club of which Shakespeare, Jonson, Beaumont, Fletcher, Selden, Donne, and others were members.

Meroë, dist. of ancient Ethiopia, almost surrounded by two tributaries of the Nile, it now forms part of the Sudan. Its chief town, also called Meroë, became at an early date the capital of an important state.

Merovingians, or **Merwings**, first dynasty that ruled in France after the fall of the Roman empire. It was founded by Clovis (481-511), the grandson of Merowig, and in 752 was succeeded by the Carolingian dynasty.

Merriam, Augustus Chapman (1843-95), American classical scholar. He was connected with Columbia University from 1863 until his death. Prof. Merriam was director of the American school of Classical Studies at Athens, and published many articles on epigraphy and kindred subjects in philological journals.

Merriam, Clinton Hart (1855-1942), American biologist. He was chief of the U. S. Biological Survey. He was also a Bering Sea Commissioner in 1891. His published works

are numerous, and are very highly rated.

Merrick, Leonard (1864-1939), English novelist and playwright. He wrote *When Love Flies out of the Window*; *While Paris Laughed*; and the plays *The Elixir of Youth*, *The Woman in the Case*.

Merrill, George Perkins (1854-1929), American geologist. In 1881 he joined the scientific staff of the U. S. Geological Survey, and in 1897 became head curator of the museum. His publications include *Contributions to a History of American Geology* (1905); *Handbook of Gems and Precious Stones* (1922).

Merrill, Selah (1837-1909), American clergyman, archaeologist, and consular officer. He was U. S. consul at Jerusalem from 1882 to 1886 and at later periods, discovering the second wall of Jerusalem, and thus locating the site of Calvary.

Merri'll, William Emery (1837-91), American soldier and military engineer. He was engaged on the river and harbor improvement work of the U. S. government, particularly in the improvement of the Ohio River, the Chanoine wicket movable dam which he constructed at Davis Island, 5½ miles below Pittsburgh, being at the time of its construction one of the most notable engineering works of its kind in America.

Merrimac River, formed at Franklin, N. H., by the union of the Winnipisaukee and the Pemigewasset, which rise in the White Mts., flows through the northeast corner of Massachusetts to the Atlantic. Its course is interrupted by rapids and falls, from which immense power is obtained for cotton-spinning. Length, 150 miles.

Merrimac. See **Monitor**. **Hampton Roads**.

Merriman, Henry Seton (c. 1863-1903), *nom de plume* of Hugh Stowell Scott, British novelist. Among his works are *The Sowers* (1896), *The Isle of Unrest* (1900), *The Vultures* (1902), and *The Last Hope* (1904).

Merriman, Mansfield (1848-1925), American engineer. He made important researches in hydraulics and other phases of engineering and published many engineering and mathematical text books.

Merritt, Wesley (1836-1910), American soldier, born in New York City. He graduated at West Point in 1860, and served with distinction as a Federal cavalry officer in the Civil War. He was superintendent of the U. S. Military Academy at West Point (1882-7). In the Spanish-American War, he assumed command of the U. S. forces in the

Philippines. Subsequently, until his retirement from active service in 1900, he commanded the Department of the East.

Merry del Val, Rafael (1865-1930), Roman Catholic prelate, was born in London, the son of an attaché of the Spanish embassy there. His father was descended from an Irish family named Merry, one of whom emigrated to Spain early in the 17th century. Pope Leo XIII., in 1892, appointed him *Camerieri Segreto*, a position which required him to live in the Vatican, and brought him much into contact with the pontiff. Pius X. appointed him Pontifical Secretary of State. Merry del Val represented the Holy See on many public occasions, and in 1897 came to America to investigate the Manitoba school complications. The solution of that problem was one which he suggested.

Merry Mount, a settlement founded in 1625, within the limits of what is now Quincy, Mass., by Capt. Wollaston, and dominated after 1626, by Thomas Morton. The settlers engaged in games and pastimes which were regarded with stern disapproval by the Puritans who founded the colonies of Plymouth and Massachusetts Bay, and Morton and his followers, also in defiance of the authorities of Massachusetts, furnished rum and fire-arms to the Indians. Morton returned to Merry Mount (1629) and was again expelled by the authorities of Massachusetts Bay, in 1630. See two novels by the historian Motley, *Morton's Hope* (1839), and *Merry-Mount* (1849).

Merseburg, tn., prov. of Saxony, Prussia, is specially noted for its cathedral (11th century) and its 15th-century castle, from 1656 to 1738, the residence of the dukes of Sachsen-Merseburg; p. 29,000.

Mersey, English riv., rises in Derbyshire. Notwithstanding an entrance bar and shoals, the river ranks next to the Thames in commercial importance. The Manchester Ship Canal joins it near Irlam.

Mersina, seaport on the s. coast of Asia Minor. It is surrounded by fine gardens, and has an open roadstead as harbor; p. 15,000.

Mertensia, a genus of hardy herbaceous plants. Many are of garden value, and all are easily grown. The Virginian cowslip bears terminal racemes of blue, tubular flowers.

Merthyr-Tydfil, market town, Wales. The sole industries, upon which the whole population is more or less directly dependent, arise from the numerous collieries and iron and steel works in the vicinity; p. 71,000.

Merton College. See Oxford.

Meru, in Hindu mythology, a fabulous mountain in the center of the world, 80,000 leagues high. It is the most sacred of all mythical mountains, and the abode of Vishnu. There is a mountain of the same name in the former colony of German East Africa.

Merv, district in the Russian Transcaspian prov., Central Asia, lying in a depression of the Murghab valley. The northern part is a vast sandy plain, while the southern portion is more elevated and is occupied for the most part by an oasis. The people are chiefly occupied with agriculture and dwell in the oasis. The principal crops are wheat, melons, watermelons, barley, rice, cotton, sesame, and millet. The capital of the district is New Merv. Old Merv is one of the most venerable of Asiatic cities, being mentioned in the Zendavesta. The ruins of old Merv are mostly at Bairam Ali, 18 miles e. of the modern Russian city.

Méryon, Charles (1821-68), French etcher, was born in Paris, the son of an English physician. One of his most important etchings is a panoramic view of San Francisco, made to order from small daguerreotypes. His etchings of the Paris streets are also highly esteemed; the best known are *Abside de Notre Dame*, *Rue des Mauvais Garçons*, and *Stryge*.

Mesa (Spanish, *table*), a land form produced in the table-like hill, abundant in the arid regions of the Western plains in the United States. By erosion and reduction in size they become buttes.

Mesabi Range, a low ridge of hills in Northeastern Minnesota. The district is one of the most productive of the famous Lake Superior iron region.

Mesa Verde National Park, a tract of land in Montezuma co., Colorado, set aside by Congress in 1906 as a public reservation. It contains 41,920 acres and its highest point is Point Lookout (8,700 ft.). Its chief interest lies in the ruins of the cliff dwellers.

Mescal, a Mexican drink prepared from several species of agave by distillation. It is a colorless liquor, sometimes with a faint amber tint, has a fiery taste and contains a large proportion of alcohol.

Mescaleros, an Apache Indian tribe dwelling formerly in the Southwestern United States and in Mexico. They number about 450, occupying a reservation in Southern New Mexico.

Mesdag, Hendrik Willem (1831-1915), Dutch marine painter. He set himself to interpret an idea of immensity and boundless

space in sea and sky. His pictures are to be seen in The Hague Museum, Boyman's Museum, Rotterdam, and the Luxembourg, Paris.

Mesentery, is the broad fold of peritoneum (the great serous membrane of the abdomen) which attaches the intestines posteriorly to the vertebral column. It serves to retain the intestines in their place.

Meshcheriaks, a race of Eastern Russia, of Ugro-Finnish origin, and related to the Voguls and Bashkirs.

Meshed, or **Mash-had**, city, Northeastern Persia. It is a famous place for pilgrimages, the attraction being the tomb of Imam Riza, son of Ali, founder of the Shiites, in a magnificent and richly adorned mosque; p. 60,000.

Mesmer, Friedrich Franz or **Anton** (1733-1815), German physician, founder of the theory of animal magnetism or mesmerism. Consult Carpenter's *Mesmerism and Spiritualism*.

Mesmerism. See **Hypnotism**.

Mesne Lord. In the feudal system of land tenure, an intermediate lord, of whom lands were held in fee and who in his turn held the same lands of a superior lord. The mesne lord was thus both tenant and landlord.

Mesne Process, the execution of an order or decree issued by a court in any intermediate stage of a suit, between the writ or summons by which the action was instituted and final judgment. In the United States the term is seldom employed.

Mesoderm, the name given by embryologists to the third or middle layer, which appears in development after the ectoderm and endoderm.

Mesopotamia, the Greek and Roman name for the region lying between the Tigris and Euphrates Rivers. It is strictly a geographical term, and has never signified a political division. The northern part is fertile and, when well irrigated, produces fine crops of wheat, barley, rice, millet, tobacco, melons, dates, and other fruit. The southern part is a flat, uncultivated, badly watered steppe, overrun by predatory hordes of nomads. During the Great War (1914-19) Mesopotamia was the scene of severe fighting between the Turkish army and the British and Russian forces. Formerly including Bagdad, Basra and Mosul, Turkish vilayets, it is now known as Irak. See **IRAK**.

Mesothorium, a rayless product of thorium which becomes active when transformed into radiothorium. It is cheaper than radium,

although it requires much greater quantities of material for its production. It is found in Brazil, N. and S. Carolina and Colorado.

Mesotron, the particle of matter or energy that is shortest lived and most unstable; believed to be a product of cosmic ray disintegration high in the atmosphere. It was first noted in 1937 by Drs. Carl D. Anderson and Seth Neddermeyer.

Mesozoic, a sub-division of geological time, between the Permian and the Eocene. It includes the Triassic, the Jurassic, and the Cretaceous systems. See **GEOLOGY**.

Mesquite, two species of trees or shrubs belonging to the genus *Prosopis* and used as food by the Indians. The Common or Honey Mesquite is common in the Southwest. Curly Mesquite, or Screw Bean, is a native of N. A.

Mess. In the U. S. Army and Navy every body of men whose meals are served collectively is called a mess. In the U. S. and other navies the admiral generally messes alone, as does the captain, but sometimes the two messes are combined. Ward-room officers belong to the ward-room mess. Junior and warrant officers have their own mess room. The crew is divided into a convenient number of messes.

Messala, Roman family of the Valerian clan; its most distinguished member was Marcus Valerius Messala Corvinus, who was a generous patron of literature, and himself wrote works on history and grammar, as well as poems and speeches.

Messalina, **Valeria**, third wife of the Roman emperor Claudius I. All the writers of the period represent her as a monster of cruelty and profligacy. Narcissus at length disclosed to Claudius Messalina's relations with Gaius Silius, and Claudius ordered her death.

Messenia, district of ancient Greece, forming the southwest portion of the Peloponnesus.

Messiah, a personage whom the Israelites expected to come as the divine agent in their delivery and triumph. According to the prevalent Christian belief, a saviour was divinely promised to man at the expulsion from Eden. The Hebrews were the chosen people of God to produce the Redeemer, and their entire history was a providential training to this end. When their training was complete and the conditions of the Gentile world were also ripe, the Messiah was born at Bethlehem. The downfall of the Hebrew kingdoms and the centuries of oppression and suffering which followed perverted the national

ideal, and when the Messiah appeared, his people rejected him, because their conception was that of a temporal ruler and leader who should exalt them and execute vengeance upon their enemies. Nevertheless, it is claimed, the prophecies were remarkably fulfilled in Jesus, in a way to justify the claim which he publicly made to be the Messiah, and the judgment of the few who accepted him.

Critical historical study, in the opinion of many, requires certain modifications of this view. The application of the so-called 'Messianic prophecies' to Jesus seems to many in the highest degree strained and fanciful. Other Messiahs have appeared, particularly in times of suffering and political turmoil. Nearly all have met death with sublime readiness and fortitude; some have had a following which lasted for centuries. Consult Briggs's *Messianic Prophecy*; Wood's *Hope of Israel*.

Messina, province of Italy, in the n.e. part of Sicily. The area is 1,245 sq. m.

Messina, tn., capital of the province of Messina, Sicily. Before the Messina-Reggio Earthquake which almost totally destroyed it in 1908, it was a well-built, spacious town with lava-paved streets and an excellent sickle-shaped harbor. The city has been rapidly rebuilt since that time. Cloth and coral ornaments are manufactured, and fruits and nuts are exported; p. 182,508. It was conquered by the Allies in the summer of 1943.

Messina, Strait of, the body of water which separates Sicily from Italy. See SCYLLA and CHARYBDIS.

Messina-Reggio Earthquake. Time after time during the historic period has Italy suffered from the effects of earthquakes, but never before so severely as from that which occurred in Calabria and Sicily on the 28th of December, 1908. The probable death roll was 200,000 human beings. Seismic activity had been noticeable for several weeks prior to Christmas, 1908, within the region bordering the Strait of Messina. Great earthquakes are always, as far as known, preceded by 'preliminary tremors' which are accompanied by more or less musical sounds. There are persons who report that for a few seconds on the morning of Monday, December 28, there was a singing sound in the air like the noise of a distant windstorm. This rapidly increased in intensity and became a terrifying rumble when the great earthquake occurred that damaged buildings within an irregularly elliptical area about 85 m. long by 50 m. wide, including the city of Messina

and many smaller towns and villages. Messina was reduced to a shapeless mass of ruins.

Metabolism. The process whereby all living organisms—plants and animals—are capable of (1) incorporating into their tissues substances obtained from their food and making them integral parts of their own bodies (anabolism, assimilation), and of (2) transforming these substances into various forms of energy, such as heat and motion (katabolism, dissimulation). By the metabolism of a tissue we understand the total chemical changes taking place in the tissue. During the youth of an animal the anabolic processes are in excess, leading to the formation of new tissue, or the storing up of material for future use. At maturity the anabolic processes practically balance the katabolic processes, and the income of energy in food equals the outgo of energy in heat and motion, while during old age the katabolic processes predominate, leading to the wasting away of the tissues and the failure of the supply of potential energy.

Metacentre, a point in a floating body whose position determines the stability or instability of the body. When it is above the center of mass, the body is stable; when it is below, the body is unstable and will fall away more and more from the original position.

Metals, substances such as iron, silver, tin, mercury, which in general, possess high specific gravity, are often ductile and malleable, conduct heat and electricity well, and are opaque; though these properties vary widely in the different cases. Hardness is also a feature of great variability. In their chemical properties metals also differ much, but in general they are characterized by forming oxides of a basic character; though this is only true of the lower oxides. Alloys, or mixtures of metallic elements, such as brass or pewter, in which combination may have taken place to a greater or less extent, are also called metals. See METALLURGY, and ALLOYS.

Metal Decorative Work. Gold and silver have been chiefly selected for the richest and most costly works of art in metal; but bronze, copper, tin, and lead have not lacked application in this direction also. Cast bronze for statuary was used from remote times in Egypt and in Greece; while in Great Britain, and more especially in Ireland, there were, in ancient times, craftsmen skilled in the arts of bronze and metal working to a degree difficult for us to appreciate fully.

In the middle ages work in bronze, copper, brass, iron, lead, and tin reached a high level of artistic excellence. Armor and weapons of all kinds were often most elaborately decorated. The Renaissance ironworkers in Europe were prolific in their output, and the art showed few signs of decline until the end of the 18th century. In England, the iron gates of the palace of Hampton Court are famous examples.

Metallography is that branch of metallurgy which pertains to the structure of metals and their alloys, as revealed mainly by the microscopic examination of polished or etched sections; but also by the appearance of the fracture. The former shows the true condition of the metal before being strained or ruptured, while the latter represents the planes of weakness in the metal or alloy depending on both structure and method of rupture.

Metallurgy pertains to the extraction of metals from their ores and the subsequent manufacture into articles of commercial use. Strictly speaking, the *science* of metallurgy comprises the processes of extracting and treating all the metallic elements; in practice, however, the *art* of metallurgy is restricted to the production of the useful metals only, the preparation of the others being accomplished in chemical manufactories. In recent years the science of metallurgy has been rendered more exact, and great progress has resulted from the development of pyrometers to measure high temperatures accurately, the study by the microscope of the structure of metals and alloys, the application of the electric current to separate and refine metals and alloys, and the production of hitherto unattainable temperatures by means of the electric arc and the use of metallic aluminum. Minerals of sufficient richness, purity and quantity as to render the extraction of the constituent metal commercially profitable are called ores. All ores may be divided into three classes:—1. *Native metals*, bismuth, copper, gold, platinum and silver; 2. *Sulphides*, or compounds of the metal with sulphur—antimony, copper, lead, mercury, nickel, silver and zinc; and 3. *Oxides*, or compounds of the metal with oxygen—copper, iron, lead, tin, zinc and the rarer elements. Many metals occur in two or all of these classes. In general the native metals are treated by mechanical dressing or simple fusion; the sulphides by smelting with some substance which will combine with the sulphur and liberate the metal in the free state,

or by roasting to expel the sulphur by oxidation to sulphur dioxide gas, the residue being then treated like an oxide; and the oxides by reducing them to metal by heating with carbon or other deoxidizing agent. The roasting, fusion and reducing operations comprise various chemical reactions which are carried out at high temperatures in furnaces lined with heat-resisting material. These reactions, though very numerous, may be brought about in three ways, 1. 'Dry' or fusion processes, 2. 'Wet' or leaching processes, and 3. Electrolytic processes. Consult publications of the U. S. Bureau of Standards and the American Institute of Mining and Metallurgical Engineers, including the Journal published by the latter.

Metamorphism. A considerable part of the earth's surface is formed of rocks, which cannot be regarded as normal sediments or as igneous masses, such as are emitted by volcanoes at the present day. Yet in their chemical and structural characters they present resemblances to both groups. The name metamorphic was applied to this group by Lyell, who powerfully advocated the view that they were modified or altered by such agencies as heat, pressure, and crushing. It has been customary to discuss metamorphism from the standpoint of the most prominent agency in causing the changes—as dynamo-, thermo-, hydro-, metamorphism, etc. But it is now pretty well understood that pressure, heat, water, and chemical change are all involved together in every case of metamorphism, and that recrystallization of the original constituents of the rock is a most important result of their action. Consult *U. S. Geol. Surv. Publications*.

Metamorphosis, a term used in zoology to indicate those very striking changes in structure and habits which occur in the life-histories of the frog, butterflies, and other animals. The change frequently, though not invariably, involves, a marked change in environment, as from water to land in the case of the frog, from the sedentary to the aerial life in the butterfly. It is an essential part of the conception of a metamorphosis that the young form (larva) should be capable of living an independent existence.

Metaphor, a figure of speech in which, instead of comparing (as in a simile) the qualities common to two objects, we bodily transfer the qualities of the one to the other. Thus the sentence, 'He was a lion in the fight,' is a metaphor.

Metaphysics, a term which owes its origin

to the fact that the treatise of Aristotle now called *Metaphysics* (*meta*, 'after') was placed by a later arranger of his works next in order after the treatises on *Physics*. In current usage, where a distinction is made between metaphysics and philosophy, the latter term has the wider meaning, and includes sciences like logic, psychology, and ethics, while the term metaphysics is reserved for the most fundamental philosophical inquiries into the nature of reality. See **PHILOSOPHY**; and on the question of definition, Sidgwick's *Philosophy: Its Scope and Relations* (1902).

Metapontum (Gr. *Metapontion*; now Torre-a-mare, or Metaponto), Greek colony in S. Italy, on Gulf of Tarentum, a little W. of that town. It was founded by colonists from Achæa, probably before 600 B.C. It came under Roman power after the defeat of Pyrrhus in 275 B.C.

Metarhyolite. A term used for rhyolites or glasses that have been modified much by the agencies of metamorphism. The commonest result is a destruction of the amorphous or glassy structure, known as devitrification. The terms aporhyolite, apobsidian, etc., have been proposed by Florence Bascom for these rocks. Similar meaning attaches to the terms meta-diabase, meta-diorite and like combinations meta from metamorphic).

Metasomatism, a term applied to the process by which a mineral suffers through chemical processes, a partial or complete change in its chemical constitution.

Metastasio, Pietro (1698-1782), Italian poet and dramatist. As a lyric poet he ranks at the head of those that wrote in the second Arcadian manner. But it is as a writer of melodramas (highclass librettos for music) that he became renowned.

Metayer System, a system of farming land in which the cultivator pays his rent in a fixed proportion of the product. In America, it is called farming on 'thirds' or 'halves.'

Metazoa, the designation given to multicellular animals in general as contrasted with the Protozoa, which consist of single cells, or of colonies of independent cells.

Metcalf, Willard Leroy (1858-1925), American painter, born at Lowell, Mass. After 1889 he lived in New York. His work is characterized by the brilliant coloring and 'open air' effect.

Metcalf, James Stetson (1858-1927), American dramatic critic. He became the dramatic editor of the New York weekly *Life*, in 1889, and for several years was its literary editor.

Metchnikoff, Ilya Ilyich (1845-1916), Russian zoologist, one of the greatest authorities. In 1884 he propounded his *phagocyte* theory, that white blood corpuscles (*leucocytes*) either devour and thus kill bacteria entering an organism or make them harmless through exudation and decomposition. The Noble Prize for medicine was awarded to him in Dec., 1908.

Meteorites (Gr. 'air-stones'), metallic or stony masses of matter falling from the sky, known as 'fireballs,' 'falling or shooting stars,' 'meteoric stones,' 'thunderbolts,' 'aerolites,' etc. Some are chiefly 'meteoric iron,' others are almost entirely of stone; others, again, are a mixture of stone and iron. Lieut. Peary brought from Greenland a single mass of meteoric iron that weighs ninety tons. This is now on exhibition at the American Museum of Natural History in New York city. It is the largest mass of this material in any museum. Physicists now regard them as mere fragments of the innumerable interplanetary bodies which form a part of the solar system.

Meteorograph, an instrument giving a continuous record of fluctuations in pressure, temperature, and humidity on a moving sheet of paper driven by clockwork.

Meteorological Office, The British, was established in 1854 as a department of the Board of Trade, but is now under a director and committee appointed by the Treasury. It deals officially with the meteorology of the British Isles.

Meteorology is the science of the atmosphere, and embraces the investigation of all the properties, movements, and appearances occurring in the aerial envelope which surrounds our globe. Now each country has a weather bureau or central office, with which a large number of stations are connected, which report several times a day by means of the telegraph. In this way a knowledge of the meteorological conditions prevailing over a wide extent of the earth's surface at a given moment is available, and the course of storms approximately indicated. An important service rendered by meteorology has been in the domain of medical climatology, which is the study of the influence of the various physical elements of climate upon the human organism. The principal meteorological phenomena naturally fall into two groups—those produced by the daily rotation of the earth on its own axis; and the great seasonal changes which primarily depend on the revolution of the earth round the sun. To these

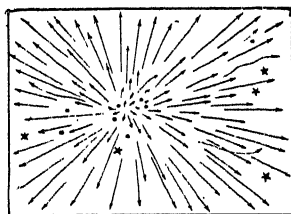
groups may be added a third—'cyclical variations,' which are related to the number and frequency of spots on the solar disc.

In nearly all parts of the globe, however, the effect of the sun's heat is modified or increased by powerful secondary agencies, as the prevailing winds and oceanic circulation. In the tropics, speaking generally, there are two varieties of weather, known as the 'dry season' and the 'rainy season'; but in America and Europe there is no such regularity in the distribution of rainfall. The same applies to the other elements of climate, more especially during the winter months. The daily variation of the barometer is most marked in tropical regions, and diminishes in higher latitudes, disappearing as we come within the Arctic and Antarctic circles. The daily curve shows two maxima, at 10 A.M. and 10 P.M. and two minima, at 3 A.M. and 3 P.M. Of these the most marked are the 10 A.M. maximum and the 3 P.M. minimum. The 3 P.M. minimum is believed to be due to the ascent of warm and consequently lighter air, caused by solar heating, and this air tends to flow away from the day hemisphere to that which is in darkness. The 10 P.M. maximum is largely due to condensation of the air after nocturnal cooling. The diurnal range of pressure is modified by proximity to the sea, or even to large lakes, and depends in no small degree on the amount of water vapor in the air.

Weather cycles, of which the most generally recognized is Bruckner's thirty-five years' period, show a connection with sun-spot phenomena. These spots wax and wane at intervals slightly exceeding eleven years, and Bruckner has traced a connection too between these phenomena and the occurrence of cyclones, rainfall, including droughts, temperature, floods, famines, and vintages, which show a periodicity separated by the sun-spot cycles, or about thirty-five years. The relations between solar and terrestrial phenomena, however, are of a more complex and intricate nature than is generally supposed. The wettest regions of the globe are in the zone of equatorial calms over the Atlantic and the Pacific, and in certain situations where warm, damp ocean winds are forced upwards by contact with mountain ranges. The driest regions are frequently found in places on the lee side of the mountains which have drained the prevailing wind of all its moisture. Speaking generally, the amount of rain increases with the height above the sea, but only up to comparatively moderate elevations. See the

text-books on meteorology by Buchan (1868), Scott (1885), Moore (1894), Loomis (1868), Waldo (1893), and Russell; consult the publications of the United States Weather Bureau.

Meteors, small cosmical bodies encountered by the earth, and rendered luminous by the resistance of its atmosphere. Some travel round the sun in hyperbolic paths, others in long ellipses. Nearly all those kindled in the



Meteors: Radiant of the Leonids.

air eventually become incorporated with the earth, either as impalpable dust, or in the massive form of aerolites. Only those meteors come within our ken which follow paths intersecting that of the earth. The Leonid meteors, the Perseids, the Lyrids, and the Andromedes have each a known cometary associate. The photographic registration of meteor-paths has been initiated at astronomical observatories.

Professor A. R. Khan of Begumpet, India, reported that a grand fireball passed over Hyderabad on October 13, 1936, at 7:33 p. m. (Indian standard time). H. Inonze of Nagoya, Japan, observed on November 11 and 12, 1936, eight meteors, four of which were Leonids.

A very remarkable meteor was observed in Europe—Germany, Czechoslovakia, Austria and Switzerland—on the night of July 23-24, 1936, notable for its long enduring train, its exceptionally low heliocentric velocity and its unusual cosmic relationship. About 500 observations have been collected, among which are many giving the coordinates of the apparent path.

Methane, marsh gas, CH_4 , is the first member and parent substance of the series of paraffin hydrocarbons. It is produced in nature by the decay of vegetable matter out of contact of the air, and thus rises in bubbles from marshy water, is set free as 'fire damp' when coal is cut, and probably owes its presence in natural gas to a similar cause.

Methodism owes its origin to the brothers John and Charles Wesley. While at Oxford

they formed a club for the purpose of acquiring regular habits of religious study and work; in Wesley's own words, 'they resolved to live by rule and method.' This earned for them the designation of Methodists. The term is now applied to the church that was the outcome of their meetings, and with various modifications to the organizations that have from time to time separated themselves from the parent church. The form of church government differs somewhat in England and America. In America the leading Methodist bodies are episcopal in their form of government. The General Conference is the highest body in the church and is the general legislative and judicial body. It convenes quadrennially and is composed of ministerial and lay delegates in equal numbers.

Originally, pastors, or itinerants, as they were termed, moved every six months; in 1900 the time limit was removed entirely. The Methodist Episcopal Church carries on the departments of foreign missions as well as many other branches of education and social service. In the Wesleyan Methodist Church of Great Britain the unit is the class meeting. The assembly which governs the whole Connection is the annual conference. All new legislation is sent down by the Conference to the district meetings. Methodism in America traces its beginnings to the work of two Irish immigrants—Philip Embury, who came to New York in 1760, and Robert Strawbridge, who emigrated to Maryland in 1766. The first Methodist church in America was built in 1768.

The Methodists grew rapidly, numbering 513,000 members in 1828. In that year a dispute on the question of lay representation in the General Conference led to the formation of the *Methodist Protestant Church* (1830). This differs radically in policy from the other Methodist bodies, having no bishops or presiding elders, and no life officers of any kind. There is a system of general, annual, and quarterly conferences similar to those of the Methodist Episcopal Church. These conferences elect a president who appoints the preachers to their charges.

The General Conference of 1844 asked Bishop Andrew, a Southerner and an owner of slaves, to desist from exercising the functions of his office. The Southern delegates in May, 1845, held a protesting conference, and formed the *Methodist Episcopal Church, South*. This body agrees in doctrine with the other branches of Methodism throughout the world. The *Wesleyan Metho-*

dist Connection of America was formed in May, 1843, at Utica, by a number of uncompromising Abolitionists who also desired a non-episcopal church. The *African Methodist Episcopal Zion Church* originated with a group of colored Methodists in New York City, who erected a church, called Zion, in 1800, and joined with other colored churches in New York, Pennsylvania, and Connecticut in a formal organization in 1820. The *Methodist Episcopal Church, Colored*, was organized in 1870 by the Southern Methodist Episcopal Church as a separate body.

On May 10, 1939 in Kansas City, Mo., occurred the unification of the *Methodist Episcopal Church, Methodist Episcopal Church, South, and Methodist Protestant Church*.

At a Uniting Conference in Kansas City, Mo., 1939, the three U. S. branches of the Methodist faith amalgamated under the name of the Methodist Church. The combined church includes 8,000,000 of the 12,000,000 Methodists in the world and is the largest Protestant unit in the U. S.

Methuselah was the oldest man of whom we have any record, dying at the age of '969 years,' in the year of the Flood.

Methyl Alcohol, or **Wood Alcohol**, or **Pyroxylic Spirit** (CH_3OH), is the simplest of the series of alkyl hydroxides or alcohols. It is one of the chief components of the liquid obtained by distilling wood. It has intoxicating properties, and death often follows the drinking of cheap whiskeys adulterated by it.

Methylated Spirit, the principal form of denatured alcohol.

Metope, a thin slab placed between the supporting triglyphs of the frieze in Doric architecture.

Metre. See **Metric System**.

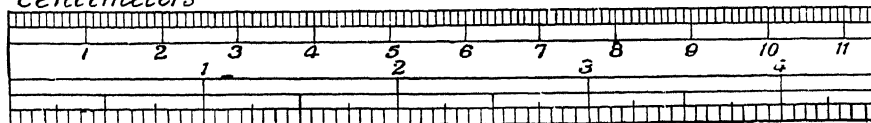
Metre is that regulated succession of certain groups of syllables in which poetry is usually written.

Metric System, a system of weights and measures instituted by the French republic in 1801, in which the unit of length is called the *metre*. This unit was originally intended to be equal to the one ten-millionth part of the distance from the Pole to the Equator; but subsequent measurements of the meridian proved that the metre had been made slightly too small, so it is now defined as the length of a certain bar of iridio-platinum (10 per cent. iridium). The metric system is more convenient than any other. It is fitted to replace the vast number of measures in common use in the United States.

The unit of length is the *metre*; of surface, the *square metre* or the *are* (100 square metres); of solid measure, the *cubic metre* or *stere*; of liquid measure, the *cubic decimetre* or *litre*; of weight, the *gram*. The multiple prefixes are from the Greek, *deka* (10),

the cubic metre and its subdivisions; in weights, the ton, kilogram, gram, and subdivisions; in measures of capacity, the litre and its subdivisions are used, but the common practice is to use cubic centimetres instead of the subdivisions of the table.

Centimeters



Inches

Metric and English Scales Compared.

hecto (100), *kilo* (1000), *myria* (10,000). The subdivisonal prefixes are from the Latin, *deci* (tenth), *centi* (hundredth), *milli* (thousandth). A gram is the weight of a cubic centimetre of water at 4° c., which is the temperature of maximum density. A litre is

The law which made the metric system legal in the *United States* was passed in 1866, and the metre officially defined as 39.37 inches. This differs from the generally accepted value by less than one-thousandth of an inch, and does not affect the length of the



Courtesy of Metropolitan Museum of Art.

Entrance Hall, Metropolitan Museum of Art, New York City.

the volume occupied by a kilogram of water at 4° c.—in other words, a cubic decimetre. In linear measure, the kilometre, metre, and subdivisions of the metre are used; in square measure, the hectare, square metre, and subdivisions are chiefly used; in cubic measure,

metric measures themselves (for they are derived directly from the standard metre bar in the Bureau of Standards), but only the computations for transforming metric measures into those of current use, or *vice versa*. The metric system is now in general use by

most of the scientific bureaus of the Government.

Metronome, an instrument used for indicating and securing exact degrees of tempo in musical performances.

Metropolitan Museum of Art, New York City, the largest and most important art museum in the United States, was organized and incorporated in 1870. In 1873 the growing collection of the Museum was removed to 128 West Fourteenth Street, where it remained until its removal to its present home

building the gift of Mr. and Mrs. Robert W. de Forest), the opening in 1926 of The Cloisters, a branch museum of mediæval art at 698 Fort Washington Avenue, through the gift of John D. Rockefeller, Jr.

The Department of Paintings is especially rich in Italian and Dutch works. The nucleus of the Department of Classical Art was the Cesnola Collection. It has since been enriched by the establishment of an Etruscan gallery and Roman Court. The Department of Egyptian Art, established in 1906 has been



Courtesy of Metropolitan Museum of Art.

Metropolitan Museum of Art, New York City.

in Central Park, at Fifth Avenue and 82nd Street. The first important accession to the original collection of the Museum was the Cesnola Collection of Cypriote Antiquities, purchased in 1874, and this was rapidly followed by others. Among the many notable acquisitions have been the Benjamin Altman Bequest in 1913, a rare and valuable collection of paintings, sculpture, enamels and goldsmith's work, porcelains, tapestries, and rugs; the gift in 1914 of the William H. Riggs Collection of arms and armor; the opening in 1917 of the Pierpont Morgan Wing, the opening in 1924 of the American Wing (the

greatly enriched by the excavations of the Museum's Egyptian Expedition, working in Egypt every season since 1906. The Department of Decorative Arts was divided in 1934 into three new divisions: mediæval, Renaissance and Modern, and The American Wing. It comprises large and important collections of mediæval material exhibited both in the main building and at The Cloisters. The Department of Arms and Armor includes a great variety of types as well as objects of highest artistic merit and historical interest. It is especially rich in harnesses of the 15th century.

The Department of Far Eastern Art was established in 1915, and includes examples of the arts of China, Japan, Chinese Turkestan, Cambodia, Siam, Tibet, and Korea. The Department of Prints was created in 1916. There are many special collections of peculiar interest. The Metropolitan Museum of Art is especially active along educational lines. Special privileges are allowed to students and lectures are given for the general public. The president is George Blumenthal. For further information consult the Museum publications; especially the *Guide to Collections*

Metsu, or **Metzu**, **Gabriel** (1630-67), Dutch painter, was born in Leyden. His *Visit to the Nursery* and *Music Lessons* are in the Metropolitan Museum, New York City.

Metternich, **Clemens Wenzel Lothar, Count**, afterward **Prince** (1773-1859). After the Battle of Wagram and the humiliating Treaty of Vienna in 1809, Count Stadion was dismissed and Metternich was appointed to take his place. The new minister set himself the task of restoring Austrian prestige. His first achievement was to conclude the marriage alliance of Napoleon to the Archduchess Marie Louise in 1810. By the Treaty of Teplitz, Austria organized the great coalition which won the all-important victory at Leipzig, and by invading France extorted Napoleon's abdication. Metternich was chosen to preside over the congress which met at Vienna to arrange the reorganization of Europe. In the so-called Holy Alliance his skillful diplomacy enabled him to take the leading position, and he employed the concert of the great powers to repress all tendencies to liberty and national independence. At length the revolutionary movement of 1848 finally overthrew his administration. He sought refuge in England, and never resumed office. The *Autobiography* of Metternich, edited by his son, throws valuable light on the stirring times in which he lived.

Metz, fortified town, France, in the department of Moselle, on the River Moselle at its confluence with the Seille; 100 m. n.w. of Strasbourg. It was formerly the strongest fortress of German Lorraine, and before 1871 was the principal bulwark of the northeastern frontier of France. Under the Franks it was the capital of Austrasia, and in 870 passed to the empire. In 1552 it was taken possession of by the French. In August, 1870, Metz, after a long siege was taken by the Germans; by the Treaty of Frankfurt it

was annexed to Germany; but following the Great War it was restored to France, and all the streets and avenues were renamed; p. 69,624.

Meurthe-et-Moselle, department of n.e. France, forming the western portion of the Lorraine plateau. The department stands first in France for the production of rock salt, and around Nancy and Longwy has valuable iron mines which yield one-third of the French output. The capital is Nancy.

Meuse, (Dutch **Maas**), river of Europe which rises in the French department of Haute-Marne, to join the Waal, the left arm of the Rhine. Beyond Gorkum the united stream again divides, the s. branch reaching the North Sea by the Hollandsch Diep's two arms, Krammer and Haringvliet; the north branch, the Merwede, subdivides beyond Dordrecht into the Old Meuse and the North Channel. The latter joins the Lek and the united stream forms the New Meuse, which reaches the sea beyond the Hook of Holland.

Meuse, department of Northeast France, forming part of Lorraine. It is intersected from n. to s. by the River Meuse, and contains the headwaters of the Marne. The West Argonne hills are clothed with forest. Bar-le-Duc is the capital.

Mexican War, the conflict between the United States and Mexico in 1846-8, growing out of the recognition of the independence of Texas by the United States in 1837, its annexation in 1845, and the assumption by the United States of the claim of Texas to the territory between the Nueces and the Rio Grande del Norte. This claim was bitterly disputed by Mexico. In July, 1845, Gen. Zachary Taylor, then stationed at New Orleans, was ordered to take up a position between the Nueces and the Rio Grande Rivers; whereupon he established himself, with a force of about 3,000 men, at Corpus Christi, s. of Nueces Bay. On April 23 a small reconnoitering party of Americans was attacked and overwhelmed by a superior Mexican force n. of the Rio Grande. News of this event led President Polk to send to Congress his war message of May 11, 1846, proclaiming that 'War exists, and notwithstanding all our efforts to avoid it, exists by the act of Mexico herself.' General Taylor crossed the Rio Grande. The U. S. Government having decided on a southern campaign from Vera Cruz to the city of Mexico, General Taylor's force succeeded in decisively defeating fully 20,000 Mexicans under

Santa Anna on Feb. 22-23, 1847, at Buena Vista. This battle virtually ended the northern campaign.

The southern campaign was conducted by Gen. Winfield Scott, who captured and occupied Vera Cruz on March 29, 1847. He marched thence to the City of Mexico. On Aug. 24 an armistice was concluded, pending negotiations for peace, conducted on behalf of the United States by N. P. Trist. The Mexicans having broken the armistice, General Scott resumed hostilities on Sept. 7; and gained possession of the City of Mexico on Sept. 14. This practically ended the war; but peace negotiations were not concluded until Feb. 2, 1848, when a treaty was signed at Guadalupe Hidalgo, ratifications being exchanged on May 30. The territory ceded by Mexico comprised the present States of California, Nevada, and Utah, most of the present New Mexico and Arizona, and part of Colorado and Wyoming.

Mexico, a country of North America lying just s. of the United States. The Tropic of Cancer crosses it about midway of its length. Along its northern boundary are California, Arizona, New Mexico, and Texas; along its southern boundary are Guatemala and British Honduras; the Pacific Ocean is on the w., s.w., and s.; and the Gulf of Mexico and Caribbean Sea are on the e. In addition to the continental body, Mexico includes the two large peninsulas of Lower California and Yucatan. The Mexican coast line measures about 6,301 m. The total area of Mexico is estimated at 767,198 sq. m., of which the islands comprise about 1,560 sq. m. Mexico is made up of 28 States, the Federal District, and two Territories.

The country consists of a great rolling tableland or succession of plateaus, bordered on each side by mountain ranges approximately parallel to the coasts. From these heights the land descends in terraces which terminate in the coastal plains. The great interior tableland rises from an elevation of about 3,500 ft. above sea level, at Mexico's northern boundary, to 8,000 ft. at Zacatecas, some 600 m. s. The principal summits—all of volcanic origin—are Orizaba, or Citlaltepetl ('Shining Star'), 18,240 ft.; Popocatepetl ('Smoking Mountain'), 17,520 ft; Ixtaccihuatl ('Woman in White'), 16,960 ft. The coasts are deeply indented with bays and gulfs, the principal ones being the Gulf of Mexico—the largest gulf in the world—and the Gulf of California. On the Atlantic Coast there are no natural harbors, owing to the

lack of deep water, the shallow lagoons and river mouths being obstructed by sand. Some of the harbors, however, especially Vera Cruz and Tampico, have been much improved by means of jetties, so that sufficiently deep and safe waters are to be found at several ports. The most commodious harbors are on the Pacific Coast and the Gulf of California. Acapulco is considered one of the finest natural harbors in the world.

There are few navigable rivers in Mexico. The Rio Grande affords the greatest opportunities for navigation. Mexico abounds in small lakes. The largest is Lake Chapala, on the boundary between Jalisco and Michoacán. It is about 70 m. long and 20 m. wide. Lake Cuitzeo and Lake Patzcuaro, both in Michoacán, are renowned for their beauty.

Owing to its geographical location, on both sides of the Tropic of Cancer, and its wide range of elevation, Mexico enjoys a variety of climate unequalled in any other part of the world. The low-lying lands along the coasts are distinctly tropical, but as one ascends the mountain slopes the heat is tempered by the altitude, until at the highest inhabited points the climate is that of the north temperate zone, and some of the mountain peaks reach into the region of perpetual snow. Nearly one-half of Mexico lies within the lowest zone. During the summer the heat here is intense. The mean annual temperature in this zone is from 75° to 85°.

The finest and most delightful Mexican climate is in the middle zone. There is little or no humidity there, and no heavy frosts. In most sections in this zone the air is dry and cool and exceedingly healthful. The mean annual temperature ranges from 60° to 77°. The cold zone, so-called, has a wider range of temperature, as it covers altitudes from 6,000 ft. up to 9,000 ft. In some localities there are frequent frosts. In others, at the same elevation, sub-tropical vegetation thrives side by side with that of the cold climates. On the higher levels the rainfall is about one-fifth of that in the middle zone, while parts of the northern and northwestern states show a deficiency of rainfall which makes irrigation an agricultural necessity.

Because of its varied climate, Mexico exhibits a remarkable variety of flora and fauna. Broadly speaking, the flora and fauna of the *tierra caliente* are tropical in character; those of the *tierra templada* are semi-tropical; and those of the *tierra fria* resemble the plants and animals of the United States. The *Flora* of the hot lowlands includes

many varieties of valuable woods. There are also many species of medicinal plants—notably sarsaparilla, jalap, arnotto, ipecac, ginger, licorice, and several varieties of mint.

The *Fauna* of Mexico is almost as extensive as the flora, and as widely varied. The animal life of the plateau regions resembles that of Southern California. The low coast regions are occupied by tropical species. Wolves, bears, coyotes, and wildcats are plentiful in the northern sections. In the forests of Southern Mexico are several varieties of monkey; a species of sloth closely related to those of South America; the ant-eater, droves of peccaries, and some wild cattle. Reptiles are abundant, including the boa constrictor, the deadly *palanca* or 'fer de lance,' and the rattlesnake, of which there are several varieties. In the lowlands there are myriads of mosquitoes and other insect pests, as well as ants and midges. Spiders of many sorts abound, the most dreaded being the venomous tarantula and the savage mygale. The silkworm thrives in most localities.

The birds of Mexico are famed for their brilliant plumage and wonderful variety. Among the songsters the mocking-bird is preëminent. Fish of many kinds are abundant, both on the coasts and in the rivers and mountain streams. Pearl fisheries are found on the western coast. The higher mountain ranges and interior plateaus of Mexico are mainly of granite formation, overlaid with volcanic matter. The coastal plains are sedimentary marine deposits of the Tertiary age, consisting of sandstones, marls, conglomerates (commonly trachyte and andesite), and shelly limestones. In the mineral wealth Mexico is reputed, for her area, to rank first among the countries of the world. She is credited with having produced nearly one-half of the world's silver for the last four centuries, and is now producing nearly one-third of the world's total output. There are mines in nearly all the states, and the mineral riches of the republic are apparently inexhaustible. The metals found in Mexico are platinum, gold, silver, copper, zinc, lead, iron, mercury, manganese, antimony, tin, bismuth, and tungsten. Other valuable minerals produced are sulphur, coal, salt, precious stones, asphalt, and petroleum. Opal of fine quality occurs.

Gold is found chiefly in Lower California, Chihuahua, Durango, Michoacán, Puebla, Sinaloa, and Sonora. Copper is widely distributed and ranks next to silver in importance among metals. Lead is also widely dis-

tributed and iron occurs throughout Mexico. Zinc, mercury, tin, antimony, manganese, and graphite are all worked with profit. Petroleum is found along the Gulf coast from Tamaulipas to Campeche. The oils are generally heavy in quality and particularly adapted to use as fuel. The development of these oil fields in the last decades has been a remarkable factor in the growth and prosperity of the country. Mexico has two of the largest petroleum refineries in the world. Although mining is a principal industry, about 97 per cent. of the 31,000 mining properties in 1931 were owned by foreign investors.

The agricultural resources of Mexico are extraordinary in value, variety, and extent, and agriculture is the chief industry of the Mexican people. Production, however, is small in proportion to the possibilities of the country. Of the total area of 767,000 sq. m., about 154,000 are unfit for cultivation. Of the tillable area, not more than one-fourth is now actually used in crop production. The chief products are maize, or Indian corn, which is the main food crop of the Mexican people and can be grown in all parts of the country; wheat; frijoles or brown beans, an important food crop; garbanzas, or chick peas; barley; rice; coffee; cotton grown chiefly in the laguna district of Coahuila and Durango; tobacco; henequen or sisal hemp; ixtle; sugar, and rubber.

Cattle raising is an important industry, as nearly all parts of the country are suitable for grazing. Sheep and goats are raised in large quantities, and horses, small but strong and hardy, are increasingly bred. Forestry is also a leading industry. It is estimated that the forested area of Mexico is approximately 44,000,000 acres. Extending from the torrid lowlands at sea level far up the slopes of the highest mountains, to an altitude of 13,000 ft., the forest growth includes a variety of arboreal products unsurpassed by any other country. The lack of transportation facilities has prevented the exploitation of the timber resources of Mexico, and they are still practically untouched. Manufacturing, while still in an undeveloped state, has made steady advancement, especially within the last decade. Methods vary from Indian hand looms in the homes, through all stages of antiquated machinery and factory buildings, to large well-equipped modern establishments. Foreign capital—especially American—has done much to develop the manufacturing interests of the country.

The most important establishments are

cotton mills, woolen, paper and silk mills, sugar mills, breweries, steel plants, tobacco and coffee factories, and glass and leather-working plants. Pottery manufacture is a flourishing local industry. The leading articles of export are oil, silver, copper, gold, henequen, coffee, rubber, chicle, cabinet woods, tobacco, vanilla, sugar, cattle, and hides. The most important ports are Tampico, Vera Cruz, Coatzacoalcos, and Progreso on the Gulf of Mexico.

Mexico has direct steamship connection with all parts of the world, with the United States, Canada, and Europe through the Gulf ports, and with China, Japan, and other ports

ondary, and professional education is free. Primary education is compulsory, but the law is enforced with difficulty. The National University of Mexico, at Mexico City, founded in 1553, was reorganized in 1910, in 1922 the National University of the Southeast was established at Mérida, Yucatan, and there are universities in Morelia, Guadalajara, and San Luis. There are a National Museum, as well as numerous State museums, and a National Library (400,000 volumes). The National Medical Institute is a well-equipped organization that keeps fully abreast of progress in medical science. The National Geological Institute and the School of En-

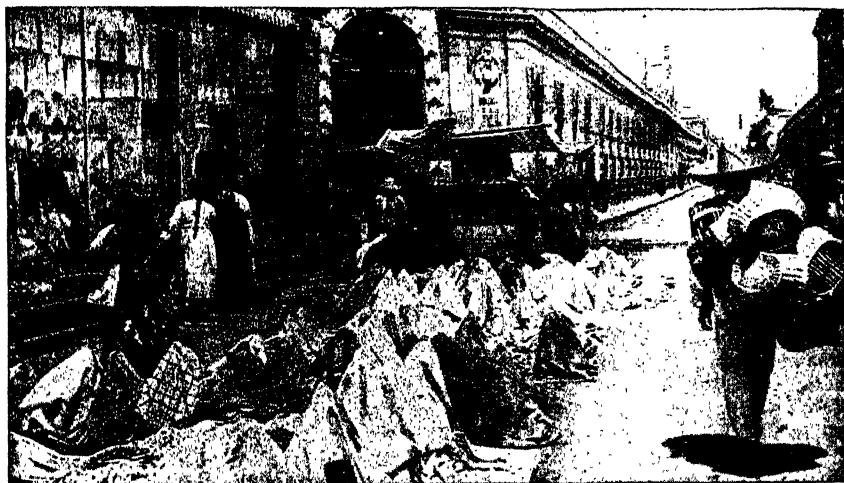


Photo from Ewing Galloway, N. Y.

Mexican Merchandising: The Cloth Market in Mexico City.

of the Far East through the Pacific ports. In 1938 there were 14,600 miles of railways in operation in the country. The National Highway Commission organized 1925, has been very active in road development. The automobile highway from Mexico City to Nuevo Laredo is now open, and there is air service to principal U. S. cities.

Education and Religion.—Missionary schools and colleges were established in Mexico as early as the 16th century, but it was not until the 19th century that a general system of education was carried out. The Superior Board of Education, established in 1902, has published a program of primary studies, the general plan of which is to be followed throughout the country; but the states have almost complete control of secondary and higher education. Primary, sec-

ondary, and professional education is free. Primary education is compulsory, but the law is enforced with difficulty. The National University of Mexico, at Mexico City, founded in 1553, was reorganized in 1910, in 1922 the National University of the Southeast was established at Mérida, Yucatan, and there are universities in Morelia, Guadalajara, and San Luis. There are a National Museum, as well as numerous State museums, and a National Library (400,000 volumes). The National Medical Institute is a well-equipped organization that keeps fully abreast of progress in medical science. The National Geological Institute and the School of En-

gineers have elaborate museums and laboratories and exceptional facilities for practical work. A National Observatory is maintained at Tacubaya, a suburb of Mexico City, and expert scholars are in charge. During the colonial period Roman Catholicism was the established religion, and enjoyed enormous power and wealth. In 1859 the connection between Church and State was dissolved, religious houses were closed, and church property was confiscated. The great mass of the population is still Roman Catholic, and the Church exerts a powerful influence, especially among the lower classes.

In 1857, when Church and State were separated, Protestantism began to take a hold in Mexico, fostered by missionaries sent by the evangelical churches of the United States. At present all the principal denominations

are represented, both by foreign missionaries and by Mexicans.

Population.—The population of Mexico in 1940 was 19,479,000. Of these, 9,040,590 were of mixed race, 4,620,880 of Indian origin, 2,444,466 pure white, 140,094 of unknown racial origin, and 158,000 foreigners. Mexico City is the capital and largest city (pop. 1,754,000); other large cities are Guadalajara, Puebla, Monterey, and San Luis Potosí. Mexico has been in the main a land of two social classes: the upper class, enjoying wealth, power, and comparative leisure; the lower class, Indian peons, living as a rule in great poverty. With the extension of commercial and industrial interests and education, a middle class is slowly developing. Retail business is practically in the hands of Spaniards and Germans.

Mexico is a Federal Republic consisting of states free and sovereign in all that concerns their internal régime. On Feb. 5, 1917, a new constitution, abolishing that of 1857, though based in the main upon it, was adopted. The republic consists of 28 states, 2 territories, and the Federal District. The national government is divided into three branches—legislative, executive, and judicial. The legislative branch is the Congress, composed of the Senate and the Chamber of Deputies. The executive power is vested in the President, who is elected for a term of six years, beginning on the first day of December next succeeding the election. A President may not be elected to succeed himself immediately. His powers are in general the same as those usually exercised by presidents of republics, although he can directly originate legislation. He is assisted by a Cabinet of seven Secretaries. The judicial power is vested in a Supreme Court of Justice and the district and circuit courts. The Supreme Court is composed of eleven justices, elected for life. The government of the individual states is, like that of the nation, divided into legislative, executive, and judicial branches. The executive is the Governor, elected for four years. The territories and the Federal District are each administered by a Governor appointed by the President.

The army and navy are under the control of the President through the Secretary of War and Marine. For convenience in administration, Mexico is divided into ten military zones under three commanderies, located respectively in Mexico, Vera Cruz, and Acapulco. The Constitution of 1917 makes military education compulsory.

Social and Economic Conditions.—Mexico's recent progress with respect to politics is especially notable; there is now more tolerance of opposing opinion and more breadth of view throughout the republic than perhaps ever before. Mexico, however, is not and never has been a political democracy. Ordinarily shifts in the social order revolve around five well-defined modern institutions, viz., government, the church, the school, the family, and the factory. In Mexico government has been, for the most part, devoid of popular or democratic significance. Progress has been made in spite of the government; this, in the broader sense, is as true of the Díaz régime as any other. The factory, or industry, in the modern sense, did not exist until toward the close of the Díaz régime, since which time it has profoundly modified the national life; but it has injected into the existing confusion far-reaching land and labor problems and has proved, for all of its benefits, a disturbing impulse. Communal ownership of land was by no means a novelty to the Spaniards that conquered Mexico. A basis thus existed for the amalgamation of their system with that of the civilized Indians of the central and southern portions of the Mexican plateau. The individual's right of possession was respected within the community; and the Indians of the free villages were in a fair way to develop the conception of private ownership of property.

There was, however, another class of Indians given in *encomienda*, to Spaniards who assumed the obligation of Christianizing them and received in return the privilege of collecting tribute from them. The benevolent legislation of the Spanish sovereigns in their behalf was defeated by the local colonial government, which passed pitiless measures legalizing the peonage of the Indians. About two-thirds of the whole population was in this wretched condition, living on fifty to seventy dollars annually and suffering chronic hunger. Great inequality in the distribution of land marked the history of Mexico from the beginning of the colonial period. Immense grants were given to individuals and the *encomienda* system enabled them to retain these vast expanses. The result was that even in the colonial period Mexico's population consisted of a very small upper stratum of highly cultivated aristocracy and large masses of poor, and often degraded, Indians and *mestizos*.

Although the *hacendados*, or large landholders, dominated the masses, they them-

selves were dominated economically by the clergy, a privileged class from the beginning of the colonial period. By 1910 concentration of property in the hands of the few had gone as far as was possible. According to the census of that year, out of a population of more than 15,000,000 the *hacendados* numbered 834, while there were 3,103,402 peons or agricultural laborers held in debt service. The latter with their families would number at least nine or ten millions. Toward the end of his administration Diaz seems to have realized that he and his predecessors had made some serious mistakes, which he set about to remedy. As revolution became more imminent and the masses more sullen and threatening, he was willing to make even greater concessions. He submitted to Congress a bill providing a manner of supplying land to the poor, of putting an end to the monopoly of waters needed for irrigation, and forcing the subdivision of large estates. The grievances of the masses, however, were too deep to be assuaged by mere promises of legislative reform. Diaz' concessions came too late and had no other effect than to make the agrarian question definitely a political issue.

The spirit of the revolution was well expressed in the instructions given by Salvador Alvarado, Governor of Yucatán, to the commissioners whom he sent to every part of the state at the triumph of the revolution, for the purpose of gathering data to facilitate the restoration of land to the villages. They were to acquaint themselves with the needs and the sufferings of the peons, individually and collectively, to try to raise their morale, to infuse into them a feeling of self-respect and a sense of human dignity, to give them hope for the future. The Indians should be made to understand that they were no longer to be enslaved for debt, that they were free to work wherever and for whomever they pleased.

History.—The early history of Mexico is obscure, resting on Spanish versions of native myths and stories rather than on critical narratives. In legend the first Nahua people, the earliest race in Mexico, were the Toltecs, who in the 7th century migrated to Anahuac, the lake country. The Toltecs were succeeded by the Chichimecs in the 14th century. After the 'Chichimec empire' came traditionally the 'Aztec empire.' Tradition holds that the Aztecs reached a high stage of civilization, and this is borne out by archaeological research (see Aztecs). The first Spanish expedition to

reach the shores of Mexico was that under Francisco Hernandez de Cordova, sent out in 1517 by Velazquez, the governor of Cuba. This having been driven back, Velazquez despatched his kinsman, Juan de Grijalva, in the following year and he coasted from Yucatan to the Tabasco River. From Velazquez, also, Hernando Cortes, in Oct. 1518, received the command of an expedition against the Aztecs. He landed at Tabasco on March 22, 1519, and in April founded the town of Vera Cruz. Having exchanged messages with Montezuma II., who attempted to dissuade him from marching inland, Cortes sank the vessels of his fleet (save one despatched to Spain), made allies of several enemies of the Aztecs, and with upward of 400 men and a number of horses and cannon set out for the Aztec capital, which he entered on Nov. 8. During the hostilities which ensued, Montezuma lost his life (June 30, 1520), and the Spaniards were forced to cut their way out from the city with heavy losses. Thereupon Cortes made Tlaxcala his headquarters, and in the spring of 1521 began an eighty days' siege of Tenochtitlan. On Aug. 13, after frightful havoc and slaughter, he gained possession of the city, and the Aztec empire came to an end.

In 1522 Cortes was appointed governor of New Spain, which included Mexico and its dependent provinces. He rebuilt the City of Mexico, the former Tenochtitlan, making it the capital, and carried the Spanish arms successfully in all directions. In 1535 the colony was made a vice-royalty. Antonio de Mendoza was the first of the viceroys, ruling with wisdom and intelligence for fifteen years. Velasco, who ruled from 1550 to 1564, emancipated 150,000 slaves, thus winning the name 'Emancipator. The fourth viceroy, Martin Enriquez de Almansa, ruled from 1568 to 1580, and was called 'the Inquisitor,' because of the introduction into Mexico of the Inquisition in 1571. In the following year the Jesuits entered the country. In the first quarter of the 17th century, Santa Fé in New Mexico was established, but of most importance in the first half of the 17th century was the contest between the government and the growing power of the Church. The thirtieth viceroy, the Conde de Galve, who ruled from 1688 to 1696, began the conquest of Texas, suppressed an Indian revolt in New Mexico, and founded the city of Pensacola in Florida. Albuquerque in New Mexico was founded in 1702. The viceroys of the last third of the 18th century included some able

rulers. The Conde de Revillagigedo, fifty-second viceroy (1789-94), remodelled the City of Mexico (the great calendar-stone and the sacrificial block were discovered at this time); established a municipal police and a system of posts; sent an exploring expedition along the Pacific coast to Alaska, and is best known in anecdotal history for wandering *incognito* in the city and discovering and remedying abuses.

Growing dissatisfaction with Spanish rule, fostered by the revolutionary ideas prevalent in the United States and France, at length led to a movement toward independence. The first important outbreak was in 1810-11, under Miguel Hidalgo y Costilla. After gaining several victories over the Royalists, he was at length defeated, captured and executed July 30, 1811. The revolt went on, however, under another priest, José Maria Morelos. The movement lacked general support, and Morelos was captured and shot. There was little disorder thereafter except for risings led by Francisco Xavier Mina (1817) and by Vincente Guerrero. Guerrero became so strong in the winter of 1820-21 that Augustin de Iturbide (1783-1824), commanding the royalist army in the south, determined to join forces with him. On Feb. 24, 1821, accordingly, was issued the Plan of Iguala, or the Three Guarantees, conserving the Roman Catholic Church, making Mexico a limited monarchy, independent of Spain, and joining the Spaniards and Mexicans on equal terms in friendly union. The new revolution, supported by the clergy, was successful, and Iturbide's military followers forced the Congress to elect him emperor (May 19, 1822). On July 21, 1822, he was crowned 'Augustin I., Emperor of Mexico.'

The empire, however, was unpopular; the army turned against Iturbide and a republic was proclaimed in Dec. 1822. A federal constitution, patterned on that of the United States, was proclaimed on Oct. 4, 1824. Nineteen states and five territories were organized, and the religion of the nation was declared to be Roman Catholic. The first president (1824-9) was Felix Fernandez, called Guadalupe Victoria. During his administration the Mexican Government permitted the colonization of Texas by Americans, led by Stephen F. Austin. The next quarter of a century was a period of unrest and internal dissension; revolt and revolution were constantly going on, success following first one and then another party leader. Santa Anna was a leading political figure, serving as president at

various times. In 1836 Texas achieved her independence of Mexico. In 1846-8 occurred the war with the United States which was concluded by the treaty of Guadalupe Hidalgo. (See MEXICAN WAR.)

In July 1861 Congress suspended payment of interest on the national debt for two years. France, which had claims against Mexico for loans to Miramon, signed a convention with Spain and Great Britain for armed intervention. In April, 1862, Great Britain and Spain abandoned intervention on learning that France intended to overthrow the republic. French troops occupied the City of Mexico on June 7, 1863. The crown of the empire of Mexico was offered to Ferdinand Joseph Maximilian, Archduke of Austria, who had been the choice of Napoleon III. Maximilian accepted, landed at Vera Cruz late in May 1864, and on June 12, 1864, was crowned Emperor of Mexico. Maximilian seriously undertook the difficult task of governing the unruly country, but early in 1867 he was besieged by the Republican forces, was betrayed by an aide, tried by court martial, sentenced to death and shot. At a general election held in August 1867, Juarez was elected President. In 1892 all limitations on the re-election of the President were removed. There was little opposition to Diaz' candidacy in 1896, in 1900, or 1904, when he was elected for a term of six years.

The remarkable advance of the country between 1884 and 1910 was largely due to Diaz' wise and complete control. In spite of the material prosperity of the country under his régime, there were those who demanded his retirement on account of his advanced age, his exercise of an autocracy subversive of the constitution, the abuse of power by his officials, etc. Among the leaders of the opposition was Francisco I. Madero, son of a wealthy landowner, who went to Texas to organize a revolt. This began prematurely in November 1910, and in the middle of April the insurgents captured Agua Prieta, across the border from Douglas, Arizona. A number of Americans were wounded, and a division of the United States army was mobilized on the border to protect American interests. Juarez, an important strategic point, was captured by the revolutionary forces on May 10, and a provisional government was organized there. An election was called on Oct. 1, and Madero was elected almost unanimously.

The first armed opposition that he encountered was led by General Reys, who was captured on Dec. 25, 1911, and imprisoned n

Mexico City. In February 1912, Madero suffered a heavier blow in the defection of Gen. Pascual Orozco, who had been his chief support against Diaz. In the meantime, on March 17, 1911, President Taft had ordered the mobilization of twenty thousand troops on the Rio Grande and stationed warships at Galveston. On Oct. 16, 1912, a serious outbreak occurred, led by Gen. Felix Diaz and on Feb. 9, 1913, another insurrection broke out in the capital, headed by Diaz and Reyes. After an intermittent battle of ten days, the Federal Generals Huerta and Blanquet, with their men, deserted Madero and went over to the rebels. Madero and Pino Suárez the Vice-President, were arrested and forced to resign. Four days later they were killed. Congress was summoned in extraordinary session, and Huerta was elected provisional president. Recognition of the new government was withheld by the United States. The American ambassador, Henry Lane Wilson, favored recognition, but President Wilson considered that Huerta had risen to power by force and murder, and was totally unwilling to have dealings with him. In July, 1913, Ambassador Wilson was recalled, and in August the Hon. John Lind was sent as a special representative from the United States to Mexico to attempt mediation. His efforts, however, were unsuccessful, and in a special message to Congress (Aug. 27), President Wilson declared that law and order in Mexico were impossible as long as Huerta remained at the head. This message was followed by a warning to all citizens of the United States to leave Mexican soil.

On April 10, 1914, a number of marines from a U. S. warship, landing at Tampico to secure gasoline for their launch, were arrested by Federal troops under Colonel Hinojosa. They were released by the commander, General Zaragoza, with an apology. Admiral Mayo considered this insufficient, however, and demanded that the American flag be saluted. Huerta declined to accede to this demand, and on April 21, a force of marines from the warships landed at Vera Cruz, seized the custom house, and later occupied the entire city. Congress responded promptly to President Wilson's request for authority to prosecute the campaign against Huerta, but preparations were halted by an offer of mediation on the part of Argentina, Brazil, and Chile. Both the United States and Huerta accepted the offer, and a virtual armistice agreement was signed. The rebel arms meantime were winning new victories. It was evi-

dent that Huerta could no longer offer effective resistance, and he resigned, appointing Francisco Carbajal, Secretary of Foreign Affairs, as his successor (July 10, 1914).

The President next invited the diplomatic representatives of six Central and South American states to meet with representatives of the United States to formulate plans for the recognition of a provisional Mexican government. By autumn Carranza was back in Mexico City and seemed to be getting the situation in hand. Accordingly, the new inter-American conference, sitting at Washington, Oct. 19, formally recognized the *de facto* government of Mexico of which General Carranza is head. Within a few weeks recognition was extended by the principal European powers. Backed by the moral support of the outside world, Carranza was now stronger than any Mexican ruler since Diaz. The chief menace was Villa. Hoping to stir up war with the United States, he swept across the Rio Grande, with several hundred bandits, and on March 9, 1916, fell on the little town of Columbus, New Mexico. An expedition was put in charge of Brigadier-General Pershing, to capture Villa and his men, and on March 15 it moved, twelve thousand strong, across the Rio Grande. The bandits, however, eluded capture, and eventually Carranza informed General Pershing that any further movement of his troops, except northward, would be considered a hostile act. In July Carranza proposed a joint commission to work out an agreement looking toward the withdrawal of the American troops and also to formulate the terms under which each nation should be entitled to send soldiers across the border for the punishment of offenders. The authorities at Washington gradually withdrew the expeditionary army, and by Feb. 5 all of the troops had recrossed the boundary at Columbus. Shortly thereafter regular diplomatic relations were resumed. On Feb. 5, 1917, a new Mexican constitution was promulgated. The position of Carranza was regularized by his election to the presidency, March 11, 1917, by an overwhelming majority.

Carranza's term extended to May 1, 1921, but as early as 1919 jockeying for the succession began. A crisis was precipitated in May 1920, by the assassination of Carranza. For the time being, power passed into the hands of General Alvaro Obregon as military dictator, although on June 1 General de la Huerta, governor of Sonora, was proclaimed provisional president. Villa surrendered in July,

and mustered out his forces, and little more was heard of him until his assassination on July 20, 1923. The collapse of the Carranza régime cleared the way for a political readjustment. In September 1920, General Obregon was elected President. The United States refused recognition to the new Mexican Government unless the article in the constitution respecting the oil question should be considered as non-retroactive. This Obregon at first refused, but in 1922 the Mexican Supreme Court decided that the much-disputed clause was not retroactive in effect, and on Aug. 31, 1923, after a satisfactory settlement of several disputed questions, the United States recognized the Obregon government. The presidential campaign of 1923-4 caused much excitement in Mexico. De la Huerta, a 'liberal conservative,' offered himself as a candidate in opposition to the radical General Plutarco Calles, the administration candidate. General Calles was chosen for the presidency on July 6, 1924, by elections remarkably free from disturbances.

In December, 1925, Congress passed, on President Calles' recommendation, the alien land and petroleum acts, which were calculated to guarantee to Mexicans and Mexico the advantages deriving from the country's natural wealth. In June, 1927, the United States Ambassador to Mexico, James R. Sheffield, resigned; he was succeeded, in September, by Dwight W. Morrow, of New Jersey. Ambassador Morrow's diplomacy was a strong factor making for more amicable relations between his country and Mexico. It was largely through his efforts that the controversy with the United States over the petroleum laws was peaceably settled in March, 1928, with the passage of executive regulations satisfactory to both countries.

On July 1, 1928, Alvaro Obregon, the only candidate, was unanimously elected President but two weeks later was assassinated by a young religious fanatic. On September 25, Congress elected Emilio Portes Gil as Provisional President. Revolution again broke out on March 3, 1929. Calles was summoned from retirement to serve as Minister of War. The rebels were decisively defeated at the battles of Jimenez and La Reforma. On November 17, 1929, Pascual Ortiz Rubio was elected President by a large majority. President Rubio was inaugurated on February 5, 1930. A decree of August 12 provided that all government-owned haciendas or ranches should be apportioned in communal grants to small holders.

Peace between State and Church, which had prevailed for two years since the agreement effected under Provisional President Gil, was ended in June, 1931, when the State of Vera Cruz put into effect a law limiting the number of priests. When President Rubio was appealed to, he said that he could not interfere with the sovereignty of the State of Vera Cruz. Meanwhile the economic depression had affected the currency. The value of silver had suffered an unprecedented fall. On July 31, to remedy the situation, Mexico was placed on a silver basis, the unit of the national monetary system being declared the silver peso and gold coinage no longer legal tender. One of the most important events of the year 1931 was the formal invitation to Mexico, unanimously approved by the Assembly, to join the League of Nations. On September 9, the day after the invitation had been extended, the Mexican Senate unanimously approved of joining. In the meantime, further bloodshed had followed the restriction of the number of priests, begun in the State of Vera Cruz. President Rubio, in the early part of January, 1932, signed a bill unanimously passed by Congress providing that in the Federal District and Territories of Mexico no creed should be represented by more than one clergyman for each 50,000 inhabitants. The Catholic Archbishop of Mexico, Pascual Diaz, strongly protested. In a letter to members of the Catholic faith in Mexico he said: 'Neither you as citizens nor I as Archbishop of Mexico can accept the law.'

In 1932 Abelardo L. Rodriguez was elected President to complete the term of office ending Nov. 30, 1934, following the resignation of Rubio, and in 1934 Rodriguez was succeeded as President by General Lazaro Cardenas.

Early in 1934, the National Revolutionary Party embarked on a six-year plan, included in which was the socialistic school reorganization, the 'Mexicanization' of industry, the control by the federal government of imports and exports, credit and insurance for exporters facilitated by the government, and sales agents officially designated in foreign countries. It covered also the modernization of the national telegraph, the construction of model houses for working people, and the creation of a federal electrical commission with broad authority over power and light companies, besides other extensive public works.

An agreement was made by Mexico June

28, 1935, in settlement of all American claims for damages arising from the revolutionary period between 1910 and 1920. It provided for the payment by Mexico to the United States of a total sum of \$5,448,020.

Relations with the United States.—The new petroleum law (Dec. 26, 1925) was subject to two contrary interpretations. Citizens of the United States own several million acres of Mexican lands. At the time of its acquisition, title to much of this land carried with it title to the petroleum beneath its surface. The Mexican principle was that the subsoil belonged to the nation, and that only the laws of 1884 and subsequent laws, as those of 1892 and 1909, gave to the owner of the surface the right to make use of subsoil, without the necessity of a concession. At the expiration of the time limit on January 1, 1927, many companies, including twenty-seven American firms, had not applied for confirmatory concessions. By amendments of January 10, and executive regulations of March 27, 1928, the law was defined more liberally, permitting the issue of titles without time limit, and extending the period of application to January 11, 1929. By the last date most companies had complied with the regulations. Important land laws were passed also in December 1925. Mexican authorities denied the claim of retroactivity made by Americans, holding that all rights acquired before the enactment of the law were recognized and respected. Property was not confiscated even when the owner refused to comply with the law, but provision was made to sell it at public auction through a legal court, and the owner received the proceeds. The U. S. Government, after clarifying the issue by several weeks of discussion, accepted the situation in general. When the alien land law went into effect, 1927, most of the aliens in Mexico had accepted it.

In March, 1938, President Cardenas decreed expropriation of oil properties in Mexico valued at \$400,000,000, owned by U. S. and British oil companies. Urgent protests by the owners were followed by efforts of the U. S. State Department and the British Foreign Office to bring about a proper settlement of the matter. Gen. Manuel Avila Camacho became president, 1941. Mexico declared war on Ger., It., and Jap., 1941.

The Religious Question.—Among other provisions of the Constitution of 1917, which aimed at control of foreign influences in Mexico, were those which sought to put religious matters under the direction of Mexicans and

to limit the power of the church in political questions. The principal points of controversy have been those regarding the provision that foreigners are not permitted to 'exercise the ministry,' that religion must not be taught in primary schools, that all church property is considered as belonging to the nation, and that all places used for religious meetings must be registered as such before the government. When the Calles government began to show a disposition to enforce these constitutional provisions, the Archbishop of Mexico stated that the Mexican church would not obey these laws.

The cessation of religious rites in all churches was ordered by the hierarchy to begin Aug. 1, 1926. Many sanguinary conflicts and sporadic acts of rebellion followed attempts to execute the laws. The Catholic bishops of Mexico refused to reopen the churches unless the Church was granted all her rights and a settlement with the State received the sanction of Rome.

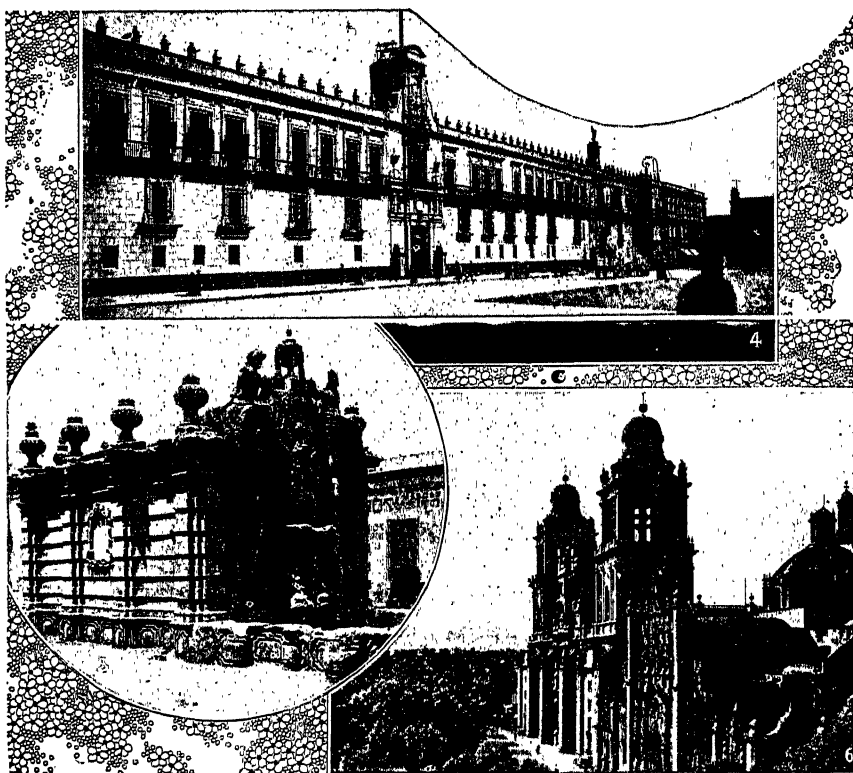
In the beginning of 1928, the government made overtures. The Minister of Public Instruction stated that the Revolution had already triumphed and that the government did not wish to destroy religious beliefs cherished for centuries. On June 21, 1929, an agreement was reached according to which the bishops were permitted to designate those priests who were to register in compliance with Mexican law; religious instruction was allowed in the churches; the right of clergymen to apply for modification of laws was guaranteed; the government was empowered to make a reasonable restriction of the number of priests. Churches and the cathedral in Mexico City were reopened with great celebration. For two years peace reigned. Then, in 1931, the State of Vera Cruz put into effect a limitation of priests of one for each 100,000 of population, other States did likewise, and in January, 1932, Congress made a similar restriction for the Federal District and the territories. Whereas in the Federal District 400 Catholic priests were officiating in 200 churches, the new law limited the number of clergymen to 24, officiating in the same number of churches.

On the advice of the Pope, Archbishop Diaz accepted the law, and church services were resumed. While the attitude of the government continued to be evidently hostile to the Church, for a year or more there was only local and state agitation over the interpretation and enforcement of the laws. Following out its program of the complete

secularization of the schools, the Mexican Congress passed, in October, 1934, a law banishing Catholic teachings in all schools of the country. This act brought to a head the conflict between supporters of the program of the State and the loyal adherents to the Roman Catholic Church, by whom it was seen as one more step in the intended achievement of a non-religious, if not avowedly atheistic, country. While labor organ-

Catholic Primate of Mexico, who is himself a native Mexican and who denies that either he or the Vatican intend to encourage resort to violence against the government.

The year 1935 saw still further charges against the Archbishop, who was again under arrest in March of that year. Meanwhile the Mexican government was the subject of condemnatory resolutions passed by Catholics within the United States, where Congress was



Views in the City of Mexico: Upper, National Palace; Left, The 'Waters' Leap' Fountain; Right, The Cathedral, looking from National Palace.

izations and other advocates of the non-religious program paraded in Mexico City, loyal Catholics crowded the limited number of churches still open under permission from the State, fearing that the program would be carried to its farthest extreme and that not only Bishops and Archbishops would be expelled from the country, but that priests would also be banished and the churches closed. At the same time charges of fostering seditious propaganda were being brought against Archbishop Pascual Diaz, Roman

several times urged to pass resolutions arraiguing Mexico for religious intolerance.

By March 15, 1936, a considerable number of churches were allowed to reopen in twelve of the states, and in the Federal District the law permitted twenty-five to be open. This policy was extended in 1937-38-39.

Art.—Through the many years of revolution in Mexico, her people have lived with the temperament. Modern fine arts in Mexico date definitely from the social revolution in 1910. The Mexican government then gave

its support to young artists, who were striving for a truly Mexican expression by commissioning them to decorate the buildings of the Ministry of Education and the National Preparatory School. There was laid the foundation of Mexican Renaissance. The frescoes that were painted on the walls of these buildings secured the cooperation of all Mexican artists, and this work was the basis of an artistic revival which indicates a period of great strength in creative art. See RIVERA.

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Mexico, Federal District of, a district of 578 sq.m. set apart by law of 1824 for the capital and the federal government of Mexico. The administration is in the hands of a governor appointed by the President of the Republic; p. 1,217,663.

Mexico: Literature. Mexican literature presents great variety of form, an abundance of lyric and narrative verse, numerous dramas, and many prose tales and novels. After the separation from Spain the dramatic form of literature was much cultivated. Manuel Eduardo de Gorostiza (1789-1851), whose comedies had won notable success in Spain, recast several of them for his Mexican public. In 1838 Ignacio Rodríguez Galván (1816-42) produced *Muñoz, Visitador de Mexico*, the first drama of modern type written in Mexico. José Pesado (1801-61) was a poet greatly admired in his time. His most enduring work is *Las Aztecas*, translations of the Aztec monarch Netzahualcoyotl, who flourished before the coming of the Spaniards. Pesado also founded *La Cruz*, a journal of real worth, to whose pages José Roa Barcena (1827-1908) contributed his first work.

The year 1868 witnessed an important revival of letters in Mexico; newspapers were established and literary societies formed.

Ignacio Altamirano (1834-93), a full-blooded Indian, whose literary work comprises poems, tales, addresses, and a semi-historical novel (*Clemencia La Navidad en la Montaña*), ranks as one of the most important of Mexican men of letters. The novel flourished in Mexico throughout the 19th century, exponents of this form of literature comprising Justo Sierra (1814-61); his son, Justo Sierra (1848-1912), a poet and critic, as well as a writer of tales and books of travel; Antonio Mateos, whose novel *El Cero des la Campanas* met with extraordinary success; and Alfonso Maldonado. Among the best of the historians are Bustamante (1774-1848); and Chavero (1841-96).

With the election of Porfirio Díaz to the presidency of Mexico in 1876 came a fresh growth of literary effort, especially in the theatre, the most successful dramatist being José Contreras (1843-1909), who attained celebrity as narrative poet as well. Gutiérrez Nájera (1859-95), a poet greatly admired by the younger generation for his gentle melancholy and musical rhythm, was one of the founders of the weekly review *La Revista Azul*, to which most of the important writers of the day contributed. The oldest publication in Mexico is the weekly *Revista de Revistas*. Consult Coester's *Literary History of Spanish America* (2d ed., 1928).

Mexico, State of, an inland state of Mexico, in the center of the Anahuac plateau, with an area of 9,230 sq.m. The e. s., and center are mountainous, having some of the greatest altitudes in the country, such as Popocatepetl in the e., with a height of 17,500 ft. The n. is generally flat. The mineral resources are valuable, gold, silver, and copper being the most important mineral products. The leading manufactures are pottery, glassware, wines, and cotton and woolen goods. Capital, Toluca; p. 978,412.

Mexico City, capital of the Mexican Republic and largest city of Latin North America, situated in a valley in the plateau of Anahuac. It is about 7,850 ft. above sea level, and has an area of about 15 sq.m. The surrounding scenery, which includes views of Popocatepetl, Ixtaccihuatl, and the Ajusco Mountains, is beautiful and impressive, and the climate, owing to the city's height above sea level and the modifying influence of the mountains, is equable and agreeable. The mean temperature ranges from 60° to 65° F. in summer, and rarely falls much be-

low 53° F. in winter. The central and most important historical feature of the city is the Plaza de la Constitución, known also as the Plaza Mayor, a square whose area is 14 acres. The Cathedral, on the n. side of the Plaza, is the finest church edifice in the country. Other prominent buildings are the National Museum, containing an unequalled collection of Mexican antiques; the Academy of San Carlos, with many interesting and beautiful paintings, some by native artists; and the National Library, with 250,000 volumes and historical manuscripts of great value. Among the educational institutions are the Schools of Mines, Medicine, and Arts, and the Conservatory of Music. Near the Alameda, the leading park, begins the Paseo de la Reforma, over 2 m. long, one of the finest drives and promenades in the world.

Mexico City is the chief distributing center in Mexico. It manufactures cigars and cigarettes, pottery, paper, gold and silver work, saddlery, linen, cotton and silk goods, corks, leather goods, soap, carriages, aeroplanes, etc. It has an extensive system of electric tramways and there are ten daily papers. The original site of the city was on a marshy island, but in 1889 a great drainage canal, 43 m. long, was completed. The city had a notable history before its conquest and destruction by Cortes in 1521. He rebuilt it, and between 1600 and 1800 it grew from 15,000 to 120,000 in population. It was captured by U. S. troops in the war with Mexico, and in 1863 by the French forces sent to carry out the scheme of Napoleon III. for a Latin empire; p. 1,754,000.

Mexico, Gulf of, a gulf or inland sea between the United States on the n., and Mexico on the w. and s. Its greatest length from e. to w. is 1,100 m.; its greatest breadth from n. to s. is about 800 m. Area, about 600,000 sq.m. It is connected with the Atlantic Ocean by the Strait of Florida and Yucatan Channel; and at the entrance, midway between the Florida and Yucatan peninsulas, whose extremities are about 450 m. apart, lies the island of Cuba. The only well-marked indentation of the gulf is Campeachy Bay, between Mexico and the Yucatan peninsula.

The chief rivers emptying into the Gulf of Mexico are the Mississippi, Rio Grande, Sabine, Brazos, Colorado, Alabama, and Tombigbee (united in the Mobile), and Chattahoochee (Apalachicola), all from the United States. There are comparatively few

harbors on the coast line of about 3,000 m., the best being Vera Cruz, and Tampico in Mexico, and Galveston, Pensacola, Tampa, and Mobile in the United States. The most noteworthy feature of the gulf is the Gulf Stream, which enters it through the Caribbean Sea and the Yucatan Channel, and passes through the Strait of Florida into the North Atlantic. It raises the temperature of the gulf 8° to 9° higher than that of the Atlantic in the same latitude.

Meyer, Adolf (1866), Swiss-American psychiatrist, was born in Niederweningen, near Zürich, Switzerland. He has served as director of the Pathological Institute, New York Hospitals (1902-10); professor of psychiatry at Cornell University Medical College (1904-9); professor of psychiatry at Johns Hopkins University, and director of the psychiatric clinic of Johns Hopkins Hospital (since 1901). He is president of the American Psychopathological Association. He has published monographs and numerous articles in scientific publications.

Meyer, George von Lengerke (1858-1918), American diplomat, born in Boston. He was appointed by President McKinley, U. S. Ambassador to Italy in 1900-5; and by President Roosevelt to Russia in 1905-07, where he was instrumental in arranging with the Russian Emperor the Peace Conference held in Portsmouth between Russian and Japanese plenipotentiaries. From 1907 to 1909 he served as U. S. Postmaster-General in President Roosevelt's Cabinet; and in 1909 was appointed Secretary of the Navy by President Taft.

Meyer, Kuno (1858-1919), German-Irish educator and author, born in Hamburg, Germany. He founded the School of Irish Learning (1903).

Meyerbeer, Giacomo (1791-1864), German musical composer, was born in Berlin. When only nine years old he was considered one of the best pianists in Berlin. The works which have firmly established Meyerbeer's reputation as a great dramatic composer are *Robert le Diable* (1831); *Les Huguenots* (1836); *Le Prophète* (1849); *L'Etoile du Nord* (1854); *Dinorah* (1859); and *L'Africaine* (1864, first performed in 1865). His orchestration is extremely brilliant. He was also the composer of an oratorio, and a large number of cantatas and songs. Consult Hervey's *French Music in the Nineteenth Century* (1903).

Meynell, Alice Christiana (née Thompson) (c. 1853-1922), English poet and essay-

ist, was born in London. Among her works are *Preludes* (1875); *Poems* (1893); *Later Poems* (1901); and other works in the form of prose essays.

Mezereon, the popular name given to the little shrub *Daphne mezereum*, whose fragrant, rosy flowers are so welcome in February and March, before the leaves appear.

Mézières, town, capital of the department of Ardennes, France, on the Meuse River.

Mezzanine, a story introduced between any two floors of a building, commonly between the first and second, and usually extending over a part only of the lower floor.

Mezzo, an Italian word, meaning half or medium, frequently used in music, usually to modify, other musical terms. *Mezzo soprano* is the female voice between the soprano and the contralto in register.

Mezzotint, a method of engraving upon metal in which the surface of the plate (copper gives the finest results, but steel is now greatly used), having been covered with a close network of crossed lines (making a burr all over, which, before being worked upon by the engraver, would, if inked, print a uniform dark tone), the half tones are obtained by scraping the roughened surface partially and in different degrees away, and the high lights by scraping it away completely and polishing the parts. Mezzotint was invented by Ludwig von Siegen about 1642, and introduced into England by Prince Rupert. The art reached its highest development in portraiture, for which it is specially adapted, after 1750, when Macardell, J. Raphael Smith, Earlom, and others engraved many of the finest pictures of Sir Joshua Reynolds and his contemporaries. Introduced into the United States in 1727 through the work of Peter Pelham, the art was followed with distinction by John Sartain. Consult Hayden's *Chats on Old Prints* (1906); Salaman's *Old English Mezzotints* (1911).

Mho, a term introduced by Lord Kelvin for the measurement of electric conductivity or conductance. It is the reciprocal of the ohm.

Miami, city and port of entry, Florida, situated on the semi-tropical east coast and enjoying a climate of all-year sunshine, has become the winter metropolis of the South. It is the seat of Miami University, sponsored by the late William Jennings Bryan and made possible by a \$4,000,000 gift from George E. Merrick. Its hotels, including the Miami Biltmore at Coral Gables, rank those of the great resorts of the world. The races at Hialeah Park annually attract thousands of visitors. The city successfully weathered the collapse of the Florida land boom and in the winter of 1934-35 enjoyed a business upturn. Hundreds of wealthy Americans have homes in and near Miami and at Miami Beach. The airport is a principal station on the routes to Cuba and South America; p. 172, 172.

Miami University, a non-sectarian co-educational collegiate institute at Oxford, Ohio, founded in 1809, and supported by the State of Ohio and the income from a grant of land by Congress.

Miao-tse, or **Miau-Tsi**, a name applied by the Chinese to the semi-independent aboriginal tribes, driven back into the mountainous districts in Southwest China.

Mica, a group of minerals which readily split up into thin flakes, owing to their perfect cleavage. They are complex silicates of aluminum, along with iron, magnesia, or the alkalis, and constitute an important rock-forming group, being almost always present in the crystalline rocks, and constituting about 4 per cent. of the total rock crust. These scales of mica have flexibility and elasticity, properties possessed by no other mineral. They have a vitreous or pearly lustre, and range in color from black (biotite) to brown (phlogopite), violet (lepidolite) yellow, green (fuchsite), and colorless. Muscovite, a clear, colorless potash mica, may be obtained in plates two ft. in diameter, perfectly transparent.

Micah, one of the twelve 'minor' prophets, a younger contemporary of Isaiah, said to have prophesied in the reigns of Jotham, Ahaz, and Hezekiah, kings of Judah.

Micaschist, a finely schistose or fissile rock, composed of alternating thin, wavy, or irregular bands or flakes of mica and quartz. Garnet, tourmaline, feldspar, kyanite, and other minerals are frequent in micaschist.

Michael, one of the seven archangels. In the Western church his day is September 29, in the Eastern, November 9.

Michael, the name of nine emperors of Constantinople whose reign covered the period from 811 to 1320.

Michael, Tsar of Russia, from 1613 to 1645, founder of the Romanov dynasty which continued in power until 1917.

Michaelmas, or the feast of St. Michael and All Angels, observed on Sept. 29. In England it is one of the quarterly rent days.

Michaelmas Daisy. See **Aster**.

Michelangelo, (**Michael Angelo**) **Buonarroti** (1475-1564), Italian sculptor, paint-

ter, architect, military engineer, and poet, the culminating genius of the Renaissance. He was the first great modern sculptor. The son of a poor gentleman of Florence, Michelangelo was born in Caprese. His father apprenticed him to the painter Ghirland

he met the most eminent men of the day. Signorelli, Botticelli, Leonardo da Vinci—whose *Battle of the Standard* strengthened his natural tendency to the expression of movement in art—Perugino, Titian were among his contemporaries. In Lorenzo's



Miami, Florida.



Michelangelo (Self-portrait).

de' Medici (1488), whom he aided with the frescoes in Santa Maria Novella. Later, Lorenzo the Magnificent took him to his house. There

school, which contained a priceless collection of antiques, he found his vocation; got marble, and struck out the *Fawn's Mask* (in the Bargello), and his first bas-relief, *The Battle of the Centaurs*.

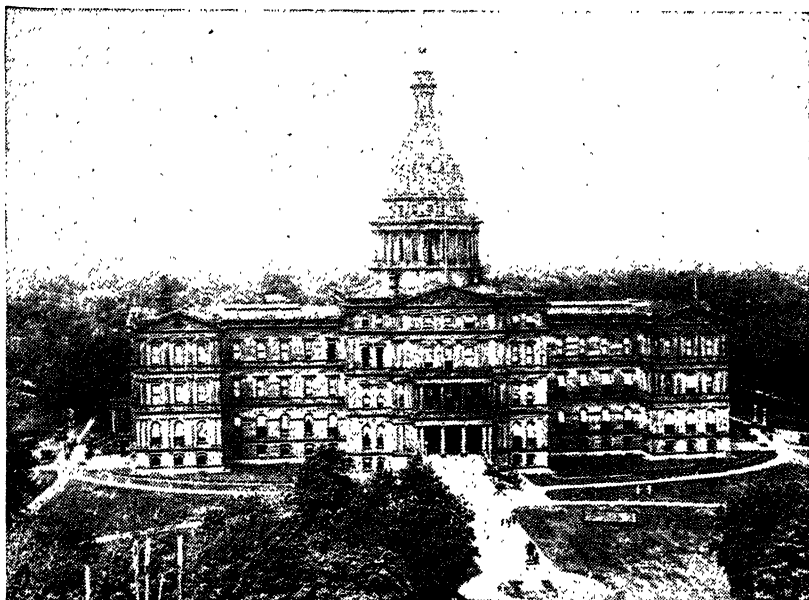
On the fall of the Medici, Michelangelo fled to Bologna, and in 1496 to Rome. To this period belong the *Cupid* in the South Kensington Museum, and the *Pietà* in St. Peter's, the first example of his grand style. He was in Florence in 1501-5; carved the famous statue of *David*, and painted *The Holy Family of the Tribune* and the *Manchester Madonna*. Pope Julius II. summoned him to build him a mausoleum in St. Peter's. Through 40 years of opposition and obstacles, aptly called the 'Tragedy of the Sepulchre,' he struggled with, yet never completed, this design: of it there exist only the *Moses* (Rome) and *The Bound Captives* (Louvre). In 1508 Julius II. commissioned him to decorate the ceiling of the Sistine Chapel; that marvellous series of frescoes, architecturally designed, filled with mighty forms, inexhaustible in symbolic language of the human figure. Leo X. sent him for 6 years to excavate marble from quarries for the building of the façade of St. Lorenzo, Florence. In 1524, under Clement

VII, he designed the Laurentian library and the famous Medici tombs with the grand figures of *Day and Night, Dawn and Twilight*, completed by 1536. In his 60th year he was commissioned by Paul III. to paint the *Last Judgment* in the Sistine Chapel.

Michelangelo never had a free hand to work as he listed; his life was a continual struggle with patrons, against enemies and circumstances. A lover of simplicity and solitude, he lived in the midst of intrigue and treachery. In 1547 he was appointed chief architect of St. Peter's. To him are

de la femme, de la famille; Les Jesuites; La sorcière.

Michelson, Albert Abraham (1852-1931), American physicist, was born in Strelno, Poland. He received the Nobel Prize for physics (1907), and the Draper Medal (1910). Early in his scientific career he attracted wide attention by his experiments in optics and electricity. His measurements of the velocity of light, made from 1878 to 1882, are accepted as being most accurate. By means of an interferential refractometer, which he invented, he carried out a



State Capitol, Lansing, Michigan.

due the proportions of the grand dome and the structural security of the enormous building. See Walter Pater *The Renaissance: Studies in Art and Poetry* (1912). Despite his aloofness from women, his finest sonnets are those written to Vittoria Colonna, the widow of the Marquis of Pescara, with whom a fine and solacing friendship lasted till her death (1534-47). These sonnets (1623), 'torn from the language as he tore statues from stone,' are the best commentary on his solitary life.

Michelet, Jules (1798-1874), French historian, was born in Paris. Michelet's most remarkable works are *Histoire de France* (18 vols., 1833-66); *Histoire de la Révolution Française* (7 vols., 1847-53); *Du prêtre,*

large number of experiments with the view of determining linear distances in terms of the wave length of light. In 1892-3, in conjunction with Benoit, he determined the length of the international prototype meter in terms of the wave length of cadmium light. He also invented and improved physical apparatus and instruments. Among the latter are the échelon spectroscope, and a ruling engine capable of minute ruling.

Michigan (Algonquin, meaning 'Great Water,' popularly known as the 'Wolverine State'), one of the North Central States of the United States. It is divided by Lakes Michigan and Huron into two divisions, known as the Upper and Lower Peninsulas. The total area of the State is 97,940 sq.m.

of which 40,000 are water. The surface of the southern peninsula is generally even and gently rolling, while that of the northern peninsula is rough and broken. The State lies in the midst of four of the Great Lakes. Thus it has a longer coast line per unit of area than any other State. Moreover, the coast is well indented with bays, furnishing good harbor and shipping facilities. The rivers are numerous. The extensive glacial erosion and morainal deposits have furnished beds for numerous lakes, variously estimated at from 5,000 to 15,000 in number. The mineral resources of Michigan are extensive. Mining of iron ore is the leading industry of the state. Annually 12-15,000,000 tons are produced. Copper is another mineral product of importance, with an annual average of 100,000,000 pounds; petroleum 15,000,000 barrels. The corn harvest, 1940, was 58,000,000 bushels; hay 4,000,000 tons; potatoes 30,000,000 bushels.

The fishing industry of Michigan is carried on chiefly upon the Great Lakes. With frontage on Lakes Erie, Superior, Huron, and Michigan, the State ranks first in importance in the lake fisheries. Michigan has for many years been one of the leading manufacturing States, the growth of the manufacturing industries having been closely related to the development of transportation facilities. Detroit is the leading city in the world in automobile manufacturing. Michigan stands high in value of its manufactured products in the United States. Grand Rapids is regarded as the center of the furniture industry of the United States. Battle Creek manufactures large quantities of food preparations. Kalamazoo is the center of the paper and wood-pulp industry.

The present constitution of Michigan is that of 1907. The executive authority is vested in a Governor, Lieutenant-Governor, Secretary of State, Treasurer, Auditor, Superintendent of Public Instruction, and Attorney-General, all elected for a term of two years. The first Europeans to reach the borders of the present State of Michigan were the French missionaries and fur traders about 1610. In 1641 the Jesuits penetrated as far as the Falls of the Saint Mary, and in 1668 Father Marquette founded a mission at Sault Ste. Marie. Other settlements were made at Mackinac (1671) and Detroit (1701), and forts were established at the mouth of the Saint Joseph (1679) and the outlet of Lake Huron (1686). At the close of the French and Indian War

(1763), that region passed into the hands of the English. The territory was incorporated in Canada in 1774 by an act of Parliament known as the Quebec Act. In 1783, by the Treaty of Paris, it was ceded to the United States. In 1787 the region to the w. and n. of the Ohio River was constituted by Congress the Northwest Territory. In 1805 the Territory of Michigan was organized, embracing the Lower Peninsula with the southern boundary a few miles farther s. than at present. Gen. William Hull was the first governor. A State constitution was adopted in 1835, but a dispute with Ohio concerning the boundary line delayed the admission of Michigan into the Union until 1837. Lansing in 1847 replaced Detroit as the State capital; p. 5,256,106. Consult Dondineau and Spencer's *Our State of Michigan* (rev. 1930).

Michigan Agricultural College, a co-educational State institution located at East Lansing, Mich. It was chartered in 1837.

Michigan College of Mines, a mining school established in 1885 at Houghton, Mich., in the heart of the Lake Superior copper region, and supported by the State.

Michigan, Lake, one of the Great Lakes, lying wholly within the boundaries of the United States. It is the third of these lakes in point of size (22,336 sq. m.) being exceeded by Superior and Huron. Its greatest length is 307 m.; its greatest width 118 m. The fisheries of Lake Michigan are of great importance. Chicago is the largest port on the lake. Milwaukee being second.

Michigan, University of, a co-educational State institution situated in Ann Arbor, chartered in 1837, and opened in 1841. The university is a part of the public educational system of the State, but while primarily for the higher education of residents, it nevertheless welcomes students from all parts of the world.

Michoacan, state of Mexico, bordering the Pacific for 100 m. in the s.w., with the state of Mexico on the e. Its mines produce gold, silver, lead, and cinnabar, and there are rich deposits of copper, coal, petroleum, and sulphur. Other products: valuable woods, rubber, palm oil, and fibres; p. 992,000.

Mickiewicz, Adam Bernard (1798-1855), Polish poet. He early composed his Ode to Youth (*Oda do Młodości*) and his 'ballads,' which enjoy great reputation among his countrymen. He finally took up his abode in Paris. It was there that appeared in 1838

his longest and most celebrated poem, *Pan Tadeusz*.

Micmacs, North American aboriginies, an eastern branch of the Algonquian family, who formed the dominant element in Nova Scotia, Prince Edward I., New Brunswick, and adjacent parts. They remained faithful allies of the French throughout the colonial wars.

Micon, a native and painter of Athens, lived about 460 B.C. He painted the *Battle of Theseus and the Amazons* which adorned the Stoa Poecile at Athens, and had a hand in the painting of the *Battle of Marathon* in the same place. He was particularly skillful in painting horses, and was also a sculptor.

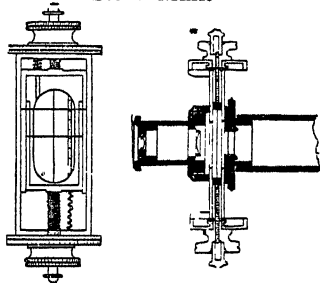
Microbe. See **Bacteriology**.

Microcline, a potash feldspar which crystallizes in oblique crystals ($h = 6$, sp. gr. 2.5), very similar to those of orthoclase. It is very abundant in many granites.

Microcosm, Macrocosm, in the language of the philosophic schoolmen meant man (the little world) and the universe (the great world) respectively. The germ of the idea is found in Pythagoras, Plato, and the Stoics.

Microcosmic Salt, sodium ammonium phosphate, $\text{NaNH}_4\text{HPO}_4 \cdot 4\text{H}_2\text{O}$, is so called from its formation in the human body, from which it is excreted in urine. It is prepared by crystallizing together solution of sodium and ammonium phosphates.

Microfilm. See **V-Mail**.



Filar Micrometer.

- 1, Front view, showing spider-lines;
- 2, the instrument in position, sectional view.

Micrometer, instrument for measuring small arcs in the field of a telescope. The original form given to it by its inventor, William Gascoigne, about 1638, is substantially that still in prevalent use. The 'filar micrometer' contains two sets of spider-lines crossing at right angles, arranged on sliding

frames in the common focal plane of the object-glass and the eye-glass. The angular distance apart of two adjacent objects, such as the components of a double star, can be determined by their bisection respectively with a pair of wires, the amount of motion given to which for the purpose is read off on a scale attached to the finely-cut screw actuating them.

Micronesia, 'small islands,' that section of the Pacific which extends, mainly in a w. to e. direction, from about 130° to 180° e. between the equator and 20° n., and comprises, going eastwards, the Ladrone, or Marianne, Pelew, Caroline, Marshall, and Gilbert or Kingsmill archipelagoes.

Microphone, an instrument used in the observation of minute sounds. It is used in conjunction with a telephone receiver. The term microphone, in radio parlance 'the Mike,' is also applied to an instrument which will convert sound waves into electrical currents. The three most important types are carbon microphone, magnetophone, and condenser microphone.

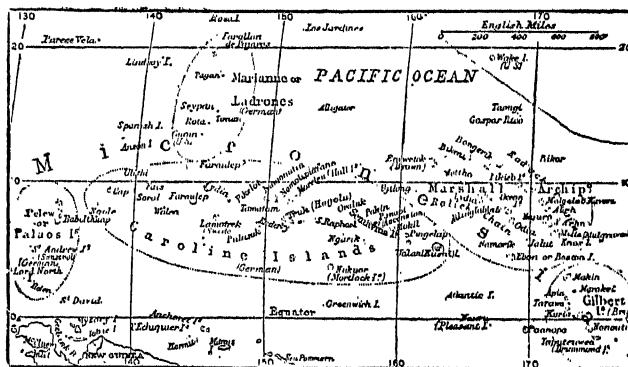
Microscope, an optical instrument for producing magnified images of small near objects. Its simplest form is a single convex or converging lens. For very high magnifications, however, the simple microscope must give place to the compound microscope, which consists of two systems of lenses relatively far apart. The system near the object is called the objective; the other, and usually upper system, is called the ocular or the eye-piece. The principle, broadly stated, is that the objective forms a virtual inverted image of the object, and that the ocular forms a virtual erect image of this inverted real image. The closeness of the object to the objective causes the rays to enter the first lens of the system at large inclinations to the axis, and the difficulties of correcting for chromatic and spherical aberration are enormously increased. It was pointed out by Lister in 1830 that, by proper adjustment of their distance apart, the spherical aberration of two achromatic doublets could be neutralized. Partly by theoretical calculations, partly by careful experimenting, lenses of suitable refractive and dispersive powers are put together to form objectives as free as possible from the imperfections referred to. Among the various forms of the compound microscope are the binocular, inverted, metallographical, filar, gas, mill, and electron.

Some of the most modern microscopes in-

clude an inclined binocular eyepiece, mechanical stage, three objectives, as well as other refinements. Magnification is from 20 to 970 diameters.

Among the most fascinating and important uses to which this instrument has been put is what is known as microvivisection—(vivisection

nucleus of a cell without interfering with the functioning of the life-currents. This process is expected to make substantially the same contribution to cell-study as animal experimentation has to medicine and biology. Its possibilities were demonstrated in 1935, before the American Institute, by Dr. Robert



Micronesia.

tion of microscopic creatures). Minute needles and pipettes of glass, in the grip of sensitive mechanical fingers, are moved forward, backward, sidewise and up and down by means of fine-thread screws in an attach-

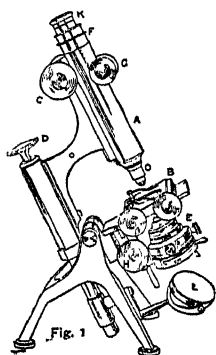
Chambers, research professor in biology at New York University.

A new illuminator for the binocular dissecting microscope has developed as a result of studies conducted under the auspices of the Department of Public Health of the Egyptian Government and the International Health Division of the Rockefeller Foundation. According to *Science Magazine* the basic principle of this device consists of the use of two equal light sources placed at such a distance apart that the same mirror reflects both beams squarely into the corresponding objectives. The entire system is enclosed as a dust-tight unit to improve its efficiency and save cleaning time. In order to reduce eye strain the light sources and all reflecting surfaces are entirely removed from the field of vision.

A simple demonstration attachment which splits the microscope light into two parts now enables two people to study conveniently the same object simultaneously. One part of the double eyepiece is horizontal, the other vertical. A further feature of modern microscopy is control of the color of the light entering the lenses by the use of filters made of colored glass, gelatin or cellophane, or even bottles containing colored water.

Microtome, an instrument designed to cut sections of animal or vegetable tissues for the purpose of histological examination.

Midas, a legendary king of Phrygia, who,



The Microscope.

A, Body; B, stage (mechanical); C, coarse adjustment; D, fine adjustment; E, substage; F, draw tube; G, rackwork adjustment; H, rackwork focusing to substage; K, eye piece; L, mirror; O, objective.

ment to the microscope. The needle-points can be so deftly manipulated under the powerful lens as to penetrate even to the sensitive

having treated kindly Silenus, the attendant of Bacchus, was granted by the god power to turn everything that he touched into gold; but finding that even his food became gold, he begged the god to revoke his favor.

Middle Ages, The, a term applied to the period from 476, when the Roman emperor, Romulus Augustulus, was deposed, to the year 1494, when Charles VIII. of France invaded Italy. The beginning of the period thus coincides with the arrival in Western Europe of the barbarian hordes. With the coronation of the Emperor Charles the Great (800) the theory of the Holy Roman empire sprang into being, and became the pivot round which all the ideas of the middle ages were grouped. Feudalism was developed. The crusades illustrated the influence of the Hildebrandine movement. After a long and intermittent struggle between the empire and the papacy, the latter conquered. But the popes, unable to defend themselves against the Italian barons, fled to Avignon. The feeling of nationality grew all over Europe; and England, France, and Spain developed national monarchies. The growth of commerce strengthened the middle classes, and, together with the use of gunpowder, dealt an overwhelming blow at the tottering fabric of feudalism.

Middlebury, village, Vermont. It is the seat of Middlebury College and the Sheldon Art Museum; p. 3,175.

Middlebury College, a non-sectarian collegiate institution at Middlebury, Vt., chartered in 1800.

Middlesbrough, town and seaport, England, in the Cleveland iron district. Has large iron and steel works, blast furnaces, foundries, rolling mills, tube works, and wire mills; p. 138,489.

Middlesex, metropolitan co. of England, with the exception of Rutland the smallest in the country; area 283 sq.m. Market gardening is carried on, and there is a large acreage under small fruit; p. 1,638,521.

Middleton, town, England. The church of St. Leonards was erected in the 15th century, on the site of an earlier building, of which the tower arch (c. 1100) remains; p. 28,309.

Middleton, Arthur (1742-87), American political leader, a signer of the Declaration of Independence, was born at the family estate on the Ashley River, S. C. He was a member of the Continental Congress in 1776-7 and again in 1781-3, voting for and signing the Declaration of Independence.

Middleton, Thomas (?1570-1627), English dramatist. Of the plays the best known are *A Fair Quarrel* (1617) and *The Changeling* (1623).

Midges, a popular name for flies belonging to the family Chironomidae, and sharing with the Culicidae, or mosquitoes, the title of gnat. After pupation the imagoes emerge, and form the swarms so commonly seen in damp localities in summer.

Midianites, a Semitic race, the descendants of Midian, one of Abraham's sons by Keturah, occupied a part of the country between the Red Sea and the Plains of Moab.

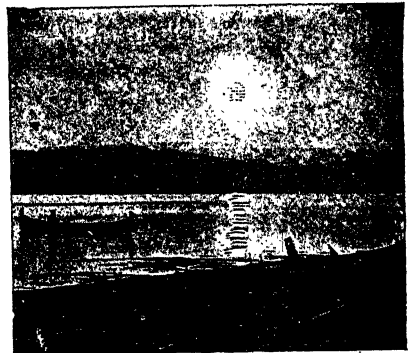
Midland, city, Midland co., Texas. It is a popular summer resort; p. 9,352.

Midlothian. See **Edinburghshire**.

Midnapur, town, capital of Midnapur district, Bengal, India. Its industries include copper, brass, silk, and indigo; p. 32,740.

Midnight Appointments, the name decisively given by President John Adams' opponents to certain appointments made by him immediately before he was succeeded by President Jefferson. President Adams was said to have been busy until after midnight on his last day of office signing judicial commissions.

Midnight Sun, the phenomenon of the sun shining at midnight in the Arctic Circle at and near mid-summer, when the sun is observed to skirt the horizon without dipping below it.



The Midnight Sun at the North Cape.

Midrash, the name given to the oldest expository material of Jewish scholars, gradually accumulated from the explanation or amplification of Scripture passages.

Midshipman, the lowest grade of officers of the line or executive branch in the navy, the name being derived, according to tradition, from the fact that the midshipmen's

stations were in the waist or mid-ship section of the ship. Midshipmen are commissioned ensigns immediately upon graduation from the U. S. Naval Academy.

Midsummer Day, the 24th of June, being the summer solstice, and therefore one of the high seasons of sun-worship, was for ages held in reverence in all the countries of Europe.

Midway Islands, a group of small islands n.w. of the Hawaiian Islands, on which an important U. S. army and navy base is located. The scene of a battle, June 3-6, 1942 in which the Japanese met defeat.

Midwifery. See **Obstetrics**.

Mifflin, Fort, a fort on Mud Island, in the Delaware river, 7 m. from Philadelphia, forming one of the defences of that city from attack by sea.

Mifflin, Lloyd (1846-1921), American poet, was born at Columbia, Pa. His *Collected Sonnets* were published in 1905. Other volumes of verse are *My Lady of Dreams* (1905); *Flower and Thorn* (1909); *As Twilight Falls* (1916).

Mifflin, Thomas (1744-1800), American political leader, was born in Philadelphia, Pa. He was a member of the Continental Congress in 1774-6 and again in 1782-4, being president from November, 1783, to November, 1784. He was implicated in the so-called 'Conway Cabal' but made amends to Washington when in December, 1783, as president of Congress, he was called upon to receive the general's resignation of his commission. In 1790-9 he was the first governor of the State of Pennsylvania.

Mignet, François Auguste Marie (1796-1884), French historian, was born at Aix. He published a series of masterly works, dealing chiefly with the 16th and 17th centuries, as *Antonio Perez and Philip II.* (Eng. trans. 1846); *The History of Mary, Queen of Scots* (Eng. trans. 1851).

Mignonette, a fragrant plant, bearing yellowish-green flowerets in crowded racemes. It can be grown both in pots and in the open, and thrives in towns.

Migraine, a paroxysmal and often periodical attack, characterized by violent headache, generally felt in only one side of the head, and accompanied with nausea. It is particularly associated with the sympathetic nervous system; and is likely to occur in members of a family in which nervous diseases are found. Other authorities associate it more particularly with errors in diet, espe-

cially with too great indulgence in nitrogenous foods. It attacks females more often than males, and is practically confined to people whose lives are sedentary.

Migration of Animals, periodic movements of large numbers of animals, both vertebrate and invertebrate. Speaking generally, these movements are determined by the supply of food or of water, or by the need of obtaining suitable breeding places in which the young may be securely reared. The phenomenon of migration is most general and most prominent among birds, for practically all birds seem to be migratory to a certain extent. A vast number of mammals indulge in more or less regular migrations, determined directly or indirectly by the changes of the seasons. Thus in the case of practically all mountain animals there is a regular and periodic alternation between the high ground in summer and the lower levels in winter. So the reindeer, the kulans or wild asses of the Asiatic steppes—and indeed the majority of the large herbivorous mammals—alternate between one feeding ground and another as the seasons make the one or the other more suitable. Migrations of quite similar type occur among fish, where the periodic movements of salmon, eel, herring, and other forms are familiar; while such reptiles as turtles also migrate to and from their breeding places. Among invertebrates, the migration of locusts to various parts of the world is well known. These migrations occur at irregular intervals, and are probably due to what may be called economic causes, such as over-production and scarcity of food.

Miguel, Maria Evarist (1802-66), usurper of the throne of Portugal, son of King John VI., was born in Lisbon. In 1828, supported by the nobility and clergy, he proclaimed himself king; but after six years of bloodshed and civil war he was dethroned and banished (1834).

Mikado, formerly the title given to the sovereign or emperor of Japan. The Japanese no longer use this word, but prefer the Chinese designations Tenshi ('Son of Heaven'), or Tenno, for which 'emperor' is the recognized English equivalent.

MITSUHIITO (1852-1912), the 122d emperor of Japan, was born in 1852. In 1868 he overthrew the power and office of the Shogun, who as *de facto* sovereign had ruled the country for over 700 years. Owing largely to his influence, Japan made remarkable

progress during his reign; and in 1889 a national constitution was promulgated. For present emperor see HIROHITO.

Miklas, Wilhelm (1872-), President of Austria. After serving as president of Parliament, he succeeded Dr. Michael Hainisch as chief executive of the republic in 1928. He was re-elected in 1931. He continued in office until union with Germany, 1938, terminated his presidency.

Milan, city, Italy, capital of Milan province. The center of the city is occupied by its chief glory, the famous Cathedral, built of white marble, commenced in 1386 and completed under Napoleon I. The Church of Sant' Ambrogio dates from the 4th century. The Dominican church of Santa Maria delle Grazie contains Leonardo da Vinci's *Last Supper*. The Ambrosian library, founded by Cardinal Borromeo, contains 200,000 volumes, besides 8,300 manuscripts. Among its theatres, the famous Teatro della Scala is of world-wide renown. It is the leading financial city of Italy and the center of the Italian book trade and of music. In A.D. 303 the Emperor Maximian I. made Milan the capital of Northern Italy. The city was ravaged by Attila the Hun in 452; and in 476 the Gothic king Odoacer made it his residence. Having been held by Spain (1545) and Austria (1714), it was occupied by Napoleon Bonaparte in 1796, who made it the capital of the kingdom of Italy in 1805; p. 1,219,000. Bombed by the Allies in 1943.

Milan IV. (1864-1901), king of Serbia, was born in Jassy, Roumania. On the assassination of his uncle, Prince Michael Obrenovitch (1868), he succeeded to the throne under a regency and in 1872 was declared of age and assumed the government. He declared war against Turkey (1876), and obtained the independence of Serbia, being proclaimed king (1882); abdicated, 1889.

Milazzo, or **Melazzo** (ancient *Mylæ*), seaport, Sicily. Its harbor is used as a place of refuge, vessels drawing 20 ft. of water being able to enter; p. 16,000.

Mildew, a general name used to include a number of minute fungi which attack a great variety of plants. The True or Powdery Mildews, belonging to the family Erysiphacacæ, attach themselves to many plants of economic value, as the apple, pear, grape, cherry, hops, wheat. The False or Downy Mildews are internal parasites belonging to the family Peronosporacæ.

Mile, a terrestrial measure of length, derived from the Roman *milliare*, which con-

tained 1,000 paces (*mille passuum*) of 5 Roman feet each, the pace being the length of the step made by one foot. The present English statute mile, adopted also in the United States, was defined by an act passed in the 35th year of the reign of Elizabeth (1593) to be '8 furlongs of 40 perches of 16½ feet each', 1,760 yards of 3 feet each, or 5,280 feet. The *geographical or nautical mile* is the 60th part of a degree of the Equator (= 1.151 English statute miles), or 2,026 yards 2 feet, and is employed by mariners of all nations.

Miles, Nelson Appleton (1839-1925), American soldier, was born in Westminster, Mass. He served for many years in the West, and played a conspicuous part in numerous wars with the Indians. In 1894 he commanded the U. S. troops under President Cleveland, and suppressed the railroad strike riots in Chicago and the Middle West; and from 1895 until his retirement in August, 1903, he was the commanding general of the U. S. Army. During the Spanish-American War of 1898 he commanded in person the forces in Cuba, and took possession of Porto Rico.

Milesians, another name for the Scots, the last of the prehistoric invaders of Ireland, from an assumed eponymous ancestor *Milesius*, whose name is a modification of *Miles*, a Latin translation of the Celtic *Gulam*.

Milesian Tales, the name for the brief, scurrilous anecdotes common at Miletus and in Asia Minor during the 1st century B.C.

Miletus, anciently the most flourishing city of Ionia, in Asia Minor. Its chief trade was in woolen fabrics and furniture. Its people early founded nearly fourscore colonies on the Black Sea and in the Crimea; sent merchant fleets to every part of the Mediterranean, and even into the Atlantic; and maintained an obstinate war with the early Lydian kings, until Cræsus was at length acknowledged as their master. After the conquest of Lydia by the elder Cyrus, Miletus submitted to Persia; but in 500 B.C. it was stirred up to rebellion against the Persians. Six years later Darius besieged the city, stormed it, plundered it, massacred most of its inhabitants, and banished the survivors to the mouth of the Tigris. Afterward the city was rebuilt, but never regained its former importance.

Milford, seaport town, Wales. Engineering, shipbuilding, and fishing are the chief industries; p. 10,116.

Milford Haven, a landlocked arm of

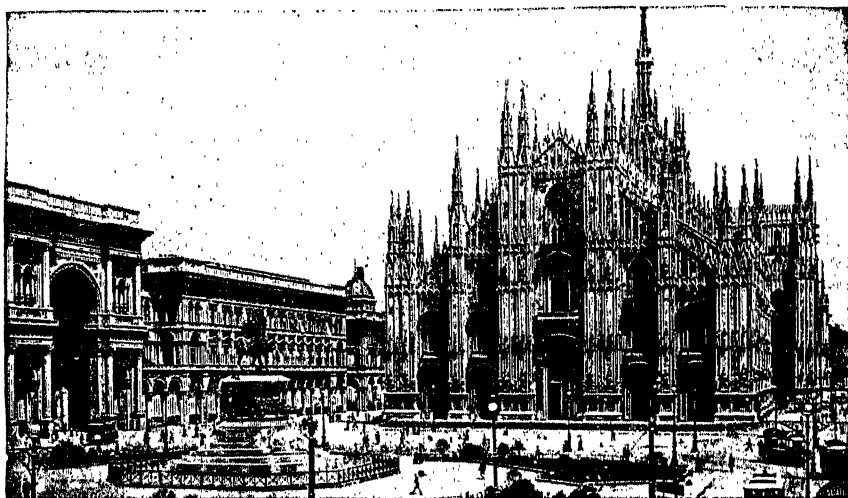
the sea, extends inland for 17 m., and is the finest, safest, and most completely sheltered harbor in Great Britain. Henry II. set sail from Milford Haven for the conquest of Ireland; Glendower's French allies landed on its shores; as did Henry VII., before the Battle of Bosworth Field.

Milford, town, Connecticut. It is a popular resort, and among its features of interest are the Memorial Bridge, built in 1889, the Taylor Library; p. 16,439.

Milford Sound, the finest and most picturesque of the fiords on the s.w. coast of South Island. New Zealand.

power for purposes of national aggrandizement, such as conquest and the forcible pushing of trade. It is essentially aggressive in character. Before the first World War militarism received its greatest modern development in Germany; but it existed and was strong in all countries in which the nobility and aristocracy controlled the army and the foreign policy of the state.

Military Academy, United States, a school for the practical and theoretical training of cadets for the military service of the United States. Upon completing its course satisfactorily, cadets are eligible for



Milan Cathedral.

Miliaria, an eruption due to retention of the sweat secretion in the epidermis at the mouth of the sweat follicles. Three types occur—*Miliaria crystallina*, known also as Sudamina; *Miliaria vesiculosa* or *rubra*, known as Strophulus or Red Gum; and *Miliaria papulosa* or *Lichen tropicus*, commonly known as Prickly Heat.

Militarism, a term formerly used to signify addiction to war, conquest, and military practices in general; the maintenance of government by the use of standing armies under the absolute control of the sovereign; and the complete subservience of the civil to the military power. It is still used in these senses, but it is also employed to designate that extreme expression of the military spirit which exalts military ideals in opposition to civil ones, and advocates the development and employment of the military

promotion and commission as second lieutenants in any arm or corps of the army in which there may be a vacancy, the duties of which they have been judged competent to perform by the Academic Board. The supervision and charge of the Academy are in the War Department under such officer or officers as the Secretary of War may assign to that duty. The occupation of West Point as a military post took place on Jan. 20, 1778, and has been continuous since that date. Upon the recommendation of Washington, a school for artillerists and engineers and for cadets attached to the corps was established by order at West Point in 1794. The destruction of its buildings by fire in 1796 caused its suspension. In July, 1801, the Secretary of War directed that all cadets of the Corps of Artillerists should report at West Point for instruction, and in Septem-

ber of that year a school was opened with four army officers and a civilian as administrators and instructors.

By Act of Congress approved April 29, 1812, the Academy was reorganized; and the provisions of this Act have furnished the general principles upon which the Military Academy has since been conducted and controlled. Appointments are made by the President upon designations by Senators and Members of Congress, each of whom selects a principal and one or more alternates. Designations may be made directly, but usually are made as the results of competitive examinations held in the district from which the appointment is to be made. The authorized strength of the U. S. Corps of Cadets, is 1,960 cadets. Since 1902 about \$7,000,000 has been expended in remodelling and rebuilding the Academy. The result is a group of college buildings among the finest and handsomest in any educational institution in the world.

Military Age, the age at which men are subject to call for military service.

Military Education. The need for military education was recognized early in the history of the United States, and the establishment of the U. S. Military Academy at West Point, N. Y., was due largely to the efforts of General Washington, who recognized the value of trained and educated officers. The fundamental object of the army educational system is the preparation of every individual and organization in the military establishment for efficient service to the nation in peace and war. The general scheme, as laid down in the regulations and orders, comprise the following: The United States Military Academy, at West Point, N. Y.; special service schools; general service schools; army correspondence schools; troops schools; post schools; courses of instruction for members of the National Guard and Organized Reserves. The entire system is under the supervision and control of the War Department General Staff. The special service schools are the Coast Artillery School at Fort Monroe, Virginia; the Engineer School, Washington Barracks, D. C.; the Mounted Service School, Fort Riley, Kansas; the Army Medical School, Washington, D. C.; the Army Service schools at Fort Leavenworth, Kansas; the Army War College at Washington Barracks, D. C. To these we may add the School of Musketry and the School of Fire for Field Artillery, both at Fort Sill, Oklahoma, and

the Aviation School at San Diego, California. Military education is also given by certain State and private schools and by the reserve training camps.

Among the most important schools of France were the Ecole Polytechnique at Paris and the Ecole Speciale Militaire at St. Cyr. The Polytechnique trained for the scientific branches of the government service, including the engineers and artillery of the army. St. Cyr trained officers for the infantry and cavalry. Entrance was by competitive examination. The British system of preliminary military education was based upon the idea of giving brief courses in the schools, but exacting a rigid competitive standard and examination at entrance. The two principal military colleges are the Royal Military Academy at Woolwich for training officers for the Royal Engineers and Royal Artillery, and the Royal Military College at Sandhurst for officers for the infantry and cavalry. Germany was the first nation to introduce universal military service. The system was inaugurated in Prussia in 1814 and was soon extended to the other German states. After the Napoleonic wars the whole country entered upon a course of military preparedness for all males. See also **MILITARY TRAINING CAMPS; MILITARY TRAINING IN THE SCHOOLS.**

Military Law. The term Military Law applies to and includes such rules of action and conduct as are imposed by a state upon persons in its military service, with a view to the establishment and maintenance of military discipline. It is largely statutory in character, and prescribes the rights of, and imposes duties and obligations upon, all persons composing the military establishment. It creates military tribunals, endows them with jurisdiction, and prescribes their procedure. It defines military offences, and prescribes appropriate penalties for the commission of such offences. In time of peace the civil law is at all times supreme or superior to the military law; but in time of war, or when the peace of the community is threatened, the civil law may be suspended for such time and in such places as may be deemed necessary, and then military laws and martial law govern.

Military Medals and Decorations. The wearing of medals indicating the performance of some sort of military service is said to have been practiced by the Chinese in the first century A.D., but was not common in Europe until the 17th century. The use

of badges and significant emblems as evidences of military service or prowess is doubtless older. The production of medals as devices for the commemoration or celebration of events began in Italy as early as the 15th century, and in the 16th they made their appearance in France, Germany, and Spain. They were often religious in character, and for this reason were frequently worn on the person. The *Distinguished Service Order* (D. S. O.) of Great Britain is a military order, membership in which is given (to officers only) for individual instances meritorious or distinguished service in war. The *Victoria Cross* is a bronze Maltese cross inscribed *For Valor* and is given to any officer or man who performs some signal act of bravery or devotion to his country in the presence of the enemy.

The medals and badges authorized to be worn by officers and men of the U. S. Army and Navy are: the Medal of Honor which is given by the President in the name of Congress for a particular deed of distinguished bravery in action. The Distinguished Service Cross; a bronze cross awarded by the President, or by the commander-in-chief in Europe in the name of the President, to any person serving in any capacity in the military or naval service who has distinguished himself or herself by extraordinary heroism (since April 6, 1917) under circumstances which do not justify the award of honor. The Distinguished Service Medal; a bronze medal to be awarded by the President to any person in the military or naval service who (since April 6, 1917) has distinguished himself or herself by exceptionally meritorious service to the government in a duty of great responsibility in time of war or in connection with military or naval operations against an armed enemy of the United States.

Service medals are awarded from time to time to each person in the naval or military service of the United States who participated in certain battles, operations, or wars, in which the United States was engaged. War-Service Chevrons.—For each six month's service in the war zone during the Great War (1914-18), a small gold chevron is worn on the lower half of the left sleeve of all except fatigue coats. In France, the most distinguished decoration is the *Legion of Honor*, established by Napoleon I. In Germany, the principal decoration is the *Iron Cross*, established by Frederick William III. in 1813. Another military and naval

order is the Red Eagle with Swords. This and the Knight's Cross of the Royal Order of Hohenzollern seem to be restricted to officers, while the Iron Cross has been frequently conferred on enlisted men.

Military Prisons are prisons set apart for the confinement of persons in the military service convicted of offences against the military laws. The *U. S. Disciplinary Barracks* is located at Fort Leavenworth, Kans., with two branches: one, the Atlantic Branch, is at Governor's Island, N. Y., and the other, the Pacific Branch, is at Alcatraz Island in San Francisco Harbor. Under the Act of Congress approved March 4, 1915, the name was changed from U. S. Military Prison to *U. S. Disciplinary Barracks*.

Military Reservations, a name applied in the United States to every post, camp, or other locality set apart for military purposes. Permanent posts are called *Forts*, while points occupied temporarily are called *Camps*. In addition to army posts, other reservations are under charge of the War Department, directly or indirectly, as some of the National Parks, several battlefield parks (Gettysburg, Chickamauga, etc.), a number of arsenals, national soldiers' homes, and national cemeteries.

Military Service Institution, an association of officers of all branches of the United States Army, both regular and militia, with headquarters at Governor's Island, New York. The object of the organization is the professional improvement of its members, and the service in general, by the interchange of ideas upon military matters, in open meetings and by publication in the columns of *The Journal of the Military Service Institution*.

Military Training Camps, as the name implies, are camps for the training of men in the principles and practice of warfare. In 1913, the Army established two Students' Military Instruction Camps, which proved so successful and so popular that in 1914 the number was increased to four. The camps were designed to give some instruction, theoretical and practical, to the students of universities and colleges, and to the graduating classes of high schools, thereby fitting them to be of much service to their country in case of war. In the Army Act of 1916 provision was made for a Reserve Officers' Training Corps, which was to consist of units at the various universities, colleges, and schools throughout the country where military instruction would be given; and field training of six weeks' duration was to be afforded

these students during the summer. Following the World War, the National Defence Act of 1916 was amended and reenacted, June 6, 1920. Among other provisions of this Act is one for the continuance of the Reserve Officers' Training Corps established by the Act of 1916. The prescribed course includes theoretical and practical military instruction and training, extending over the four years of college work, with attendance at one Reserve Officers Training Corps (R. O. T. C.) camp of six weeks duration, usually at the end of the second year. Upon completion of the prescribed course, successful candidates are tendered commissions as second lieutenants in the Officers' Reserve Corps, thus providing replacements for the veteran officers now composing that Corps.

Another provision of the Act is for the maintenance of Citizens' Military Training Camps. The purpose of these camps is to provide citizenship instruction and military training for young men who are not eligible for membership in the Reserve Officers' Training Corps camps. These camps vary in number and location, but one or more of them are conducted each year in each Corps Area. Attendance is voluntary and without compensation except for actual expenses.

Military Training in the Schools. The frequent recurrence, following the outbreak of the Great War in Europe, of incidents threatening to involve the United States in the conflict aroused much public interest in the question of preparedness for national defence. Among the many suggestions made during that period for the training of a large army was the introduction of military training in the schools and colleges. This suggestion revived an old question which has been before the American people since the Reconstruction days after the Civil War, when the Morrill Act was passed by Congress providing financial support to colleges adopting military drill as a requirement for all students.

A number of colleges and universities not deriving financial support from the National Government under the Morrill Act introduced elective courses in the theory and practice of military science. The Students Army Training Corps, which was distinctively a war measure, however was not designed as a permanent educational feature. See MILITARY TRAINING CAMPS.

Militia. By the term Militia is implied the men of a nation fit for military duty, irrespective of whether they are or are not en-

rolled and organized. With slight modifications, the militia of the various countries consists of the able-bodied men between the ages of eighteen and forty-five years.

In the United States, the militia has comprised the bulk of the fighting forces in all its wars with the exception of the Revolution and the Philippine war. Congress has persistently refused to place its main dependence upon thoroughly trained troops, and as a result the strength of the Regular Army has rarely been sufficient to form more than a nucleus about which armies have been built up from the militia or volunteers. The Constitution expressly declares that the power of calling forth the militia is vested in the President. The power to provide for calling forth the militia in order to execute the laws of the Union, suppress insurrections, and repel invasions, as well as to organize, arm, and discipline the militia, and to govern such part thereof as may be employed in the service of the United States, is specifically delegated to Congress alone. On the other hand, the power of appointing the officers and of training the militia in conformity with the discipline prescribed by Congress is reserved to the several States.

The Great War (1914-18) early brought about a realization of the necessity for greater national defence than the United States had possessed heretofore, and the pressure of public opinion on Congress culminated in the enactment of the *National Defence Act*, which was approved by the President on June 3, 1916. The most important features of this military legislation are as follows: The States are forbidden to maintain, in time of peace, troops other than those established by this law, except in the case of State police or constabulary. Within one year the enlisted men of the National Guard were to number 200 for each Senator and Representative in Congress, and were to be increased 50 per cent. per annum until 800 men are reached for such representation. The President is empowered to detail Regular Army Officers as chiefs of staff of National Guard divisions; and no organization can be disbanded or reduced below the minimum fixed by law without the President's permission. Enlistments are fixed at six years, the first three with the colors, the last three with the reserve, the qualifications being made identical with those required for the Regular Army; but the men may, if they choose, remain in active service for the entire six years.

The National Guard is to be uniformed,

armed, equipped, and disciplined like the Regular Army, and its annual training is to consist of at least forty-eight assemblies, plus fifteen days spent in encampments, manœuvres, or other exercises, including target practice. Section 111 is of extreme importance. It provides that when Congress has authorized the use of armed land forces of the United States in addition to the Regular Army, the President can draft 'any or all members of the National Guard and of the National Guard Reserve' into Government service, 'to serve therein for the period of the war unless sooner discharged.' Within a very short time after the National Defence Act became a law it was subjected to a thorough test. On June 18, 1916, strained relations with Mexico caused the President to call out the entire National Guard. In April, 1917, when the United States entered the Great War (1914-1918) the strength of the National Guard was 123,605. Within two months after the United States entered the war, the National Guard had been recruited up to 300,000 men and on August 5, 1917, these men were drafted as a body into the Federal service. The States, realizing that the place of the former militia must be filled in some way, at once began to develop military bodies of various kinds. In France the equivalent of the organized militias is the *Territorial Army*; in Germany and Austria the *Landwehr* and *Landsturm*.

Milk, the secretion of the mammary glands of the female mammal, destined as a food for its offspring from birth to such time as the teeth and digestive organs are sufficiently developed to digest other food. Cow's milk, which is typical of all others, is an opaque, yellowish-white fluid, slightly alkaline in reaction, and faintly sweet to the taste.

The qualitative chemical composition of milk is practically the same for all mammalia, and the constituents, as with other food materials, may be classified as fats, carbohydrates, proteids, and salts. The chief *carbohydrate* of milk, and the only one occurring constantly in the milk of all mammalia, is milk sugar, or lactose. Of *proteids*, the most important are casein and albumin. A number of inorganic *salts* are present, and are found in the ash when milk is dried and burned. As a food, milk contains all the nutritive compounds required by a growing animal, in the correct proportions of a scientific dietary, though it does not fulfil the conditions of a perfect food for adults. It is one of the most digestible of all animal

foods, and with other dairy products forms over 22 per cent. of the diet of the average American family. The chemical composition of milk renders it a suitable soil for the cultivation of bacteria. The souring of milk which occurs on standing is due to the presence of bacteria, through which lactic acid is formed, and the casein is precipitated in the solid form. Milk is capable of undergoing alcoholic fermentation, and then forms a beverage known as 'koumiss.'

Milk is also a suitable vehicle for the growth and transmission of pathogenic bacteria. Various methods have been devised to overcome the dangers of an impure milk supply. Pasteurization and sterilization have found most favor. In pasteurizing milk it is heated to a temperature of at least 145° F., and sometimes as high as 184°, but never higher; it is kept at this temperature for from twenty to thirty minutes, and then rapidly cooled. In sterilizing, milk is heated to a temperature of 212° F., and maintained at that temperature for some time; it is then cooled. 'Condensed milk' is milk from which most of the water has been removed by evaporation at a comparatively low temperature. The condensed milk industry in America was begun through an invention of Gail Borden, in 1856. The plan now generally adopted is to evaporate the milk, either with or without the addition of sugar, in a closed pan under reduced pressure.

Milk Fever, a popular term for the slight rise of temperature which frequently comes on about the third day after childbirth, coincidentally with a full secretion of milk. It quickly subsides when the child draws off the milk, and a cathartic is given.

Milk Snake. See *Snakes*.

Milk Sugar, or **Lactose**, $C_{12}H_{22}O_{11}H_2O$, occurs in milk, from which after removal of the fat and casein, it is obtained by evaporation.

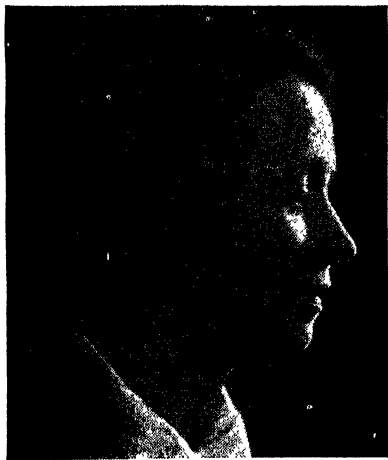
Milkweed Butterfly, or **Monarch Butterfly**, a large butterfly (*A. plexippus*) belonging to the subfamily Euploinae, and occurring throughout North America and in other countries in which the milkweeds are found. The butterflies are provided with secretions distasteful to birds and predaceous insects on which account they enjoy immunity from attack.

Milkwort, a name given to plants belonging to the genus *Polygala*, which comprises a large number of annual or perennial herbs and shrubs, of the order Polygalaceæ. There are about forty species in North America.

Milky Way, a dimly luminous zone encompassing the heavens as a great circle, which intersects the celestial equator at an angle of 63° , and has its northern pole in R.A. 12 h. 47 m., D. $+27^\circ$. Since Galileo's time the Milky Way has been known to be composed of stars. Those producing by their aggregation the observed cloudy effect are indefinitely remote and of uncertain real magnitude. The entire vast annulus is, however, of fundamental importance in the construction of the heavens, constituting, in Sir John Herschel's words, 'the ground-plane of the sidereal system.' But its influence over the distribution of the stars varies markedly for the different spectral classes.

Mill (Lat. *mille*, 'a thousand'), in the United States, is the tenth part of a cent. As a coin it has no existence.

Mill, James (1773-1836), British philosopher, was born at Northwater Bridge in Forfarshire, Scotland. He was a disciple of Jeremy Bentham, with whom he formed an intimate friendship, and he gathered around himself a number of able young men, such as Grote, Ricardo, and his own son, John Stuart Mill, who were known by the name of Philosophic Liberals.



Edna St. Vincent Millay.

Mill, John Stuart (1806-73), English philosopher, was born in London, the eldest son of James Mill. It was Locke, Helvetius, and Hartley who gave the mind of John Mill the philosophic bent which it retained till the end. Bentham's theories harmonized with a philosophy which rejected innate ideas, and which traced intellectual conceptions to experience, ethical feelings to pleasure and pain,

all under the sway of the potent law of association. But, when about twenty years of age, it dawned upon Mill that Bentham and his father had omitted from their scheme of life the all-important element of self-culture, which demands the development of the feelings and the imagination. The full extent of the change was apparent in two articles contributed by Mill to the *London and Westminster Review* (1838-40) on Bentham and Coleridge. The idea of the relativity of political constitutions, with which Coleridge had familiarized him, took firm hold of Mill's mind, and found elaborate expression in his book on *Liberty*, written in 1859. In order to correct the excesses of democracy, Mill advocated the representation of minorities, as also the adequate representation of intelligence as a controlling force. His *Principles of Political Economy*, which appeared in 1848, whilst professedly resting upon Ricardo's views, departed from them at crucial points, especially in the direction of socialism. Mill was an earnest truth-seeker, and his life was as sincere as his thinking.

Millais, Sir John Everett (1829-96), English historical, subject, landscape, and portrait painter, was born at Southampton. Together with Holman Hunt and Rossetti, he was a founder of the Pre-Raphaelite Brotherhood. He became the greatest of modern English painters, also the greatest portraitist. Among his finest portraits are his own in the Uffizi, Florence; *Carlyle*, *Gladstone* (1885), *Cardinal Newman*, *Lord Salisbury*, *Lord Beaconsfield*, *Mrs. Jopling*; and an admirable series of children portraits.

Millay, Edna St. Vincent (1892-), American poet, was born in Rockland, Maine. She was married in 1923 to Eugen Jan Boissevain. Her published works include *Renascence and Other Poems* (1917); *Figs From Thistles* (1920); *Second April* (1921); *The Ballad of the Harp-Weaver and Other Poems* (1923); *The Buck in the Snow* (1928); *Fatal Interview* (1931); *Wine from These Grapes* (1934); *Make Bright the Arrows* (1940). Winner Pulitzer Prize, 1922.

Millennium, a term applied in theology to the thousand years referred to in Rev. xx. 1-6, during which time, it is said, Satan will be bound and the martyred saints live and reign with Christ. This long triumph is to be followed by a general resurrection and the temporary release of Satan, after which will come the last judgment and the new heaven and new earth. Great Britain and America have had many distinguished millen-

ianists, among whom are Sir Isaac Newton, Charles Wesley, Toplady, Bickersteth, John Cumming, H. G. Guinness, and William Miller.

Millepedes, (*Chilognatha*), a group of air-breathing arthropods, which together with centipedes constitute the class Myriopoda.

Miller, Charles Henry (1842-1922), American painter, was born in New York City. He became a member of the National Academy of Design in 1875. His pictures, which are mostly of Long Island scenes, include: *Sunset—East Hampton* (1878); *Old Oaks at Creedmoor*; *An Autumnal Day* (1902); and *A Grey Day on Long Island* (1905). Under the pen-name of Carl de Mulder he wrote *The Philosophy of Art in America* (1885).

Miller, Cincinnatus Heine (Joaquin) (1841-1913), American poet, was born in the Wabash district of Indiana. He became editor of the *Democratic Register*, in Eugene, Ore., in 1863, and in 1866 removed to Cañon City, where in 1870 he became judge of Grant county. In 1887 he went to Oakland, Cal., where he henceforth made his home. His published works include: *Songs of the Mexican Seas* (1887); *Songs of the Soul* (1896); *Chants for the Boer* (1900).

Miller, Harriet Mann ('Olive Thorne Miller') (1831-1918), American author and student of bird life, was born in Auburn, N. Y. She wrote much for children, but was best known as an accurate and sympathetic observer of birds and their ways. She wrote *The First Book of Birds* (1899); *The Second Book of Birds* (1901); *Child's Book of Birds* (1915).

Miller, Henry (1860-1926); American actor and theatrical manager, was born in London, England, and in 1871 was brought to America. He played with Modjeska, Adelaide Neilson, and Minnie Maddern Fiske. Among his own productions are *Daddy Long Legs* (with Ruth Chatterton); *The Fountain of Youth* (1918); *The Changelings* (1923).

Miller, Nathan L. (1868-), ex-Governor and lawyer, only Republican who ever defeated Alfred E. Smith for the Governorship of New York, served from 1921 to 1923. He was general counsel for the U. S. Steel Corporation.

Miller, William (1782-1849), founder of the sect of 'Millerites,' was born in Pittsfield, Mass. He developed a theory, expounded in 1831, that the end of the world would come between March 21, 1843, and March 21, 1844, with the appearance of the Saviour as

judge of the world. Believers in a 'second Advent,' or 'Millerites,' as they were called, became tremendously excited as the presumed day of judgment approached, and made ready for the event. After the set time had passed, they resolved themselves into a new and large religious sect, known as 'Adventists,' looking to an early appearance of Christ.

Millerite, one of the ores of nickel, NiS, carrying, when pure, 64.7 per cent. of the metal. It occurs in fine hair-like crystals and tufted coatings. The mineral is found at the Gap mine, Pennsylvania, and in Missouri, Arkansas, and Wisconsin, but is nowhere very abundant.

Milles, Carl (1875), Swedish sculptor, was born near Upsala. Among his best known works are the monument to *Sten Sture*, *The Dancers*, *The Playing Bears*. Milles is considered the greatest of Swedish sculptors; his work is characterized by originality, imagination, and a symbolic quality. He came to the U. S. to live in 1929.



Millet.

1, Spicule opened out; 2, spicule in fruit; 3, caryopsis; 4, section.

Millet, a cereal grass which is grown in many countries as a forage crop, and in the Far East—especially India, China, and Japan—for food. It is especially suited for cultivation in those countries in which little rain falls and the soil is too poor and sandy for wheat or maize. The cultivation of millet is

prehistoric in the south of Europe, in Egypt, and in Asia. The Greeks knew it, as also did the Latins.

In the United States there are three groups of millets: Foxtail, Barnyard, and Broom-corn. They are rapid growers and can endure excessive heat and sunlight. The barnyard millets are the most valuable group for cultivation in the United States. They include the varieties of the species *Panicum Crusgalli*. A variety imported from Japan makes an exceptionally fine forage crop and a variety common in the southwestern part of the United States known as 'Ankee' grass is important. Broom-corn millet is the common millet of Europe; it has been cultivated for centuries and is regarded by many as the true millet. It has a bushy head and the seeds are produced at the ends of long branches.

Millet, Aimé (1819-91), French sculptor, was born in Paris. His masterpiece is the colossal *Vercingétorix* at Alise-Ste.-Reine in Côte-d'Or (1865). Other works are *Apollo*, surmounting the grand opera; *Mercury* at the Louvre, and many portraits.

Millet, Francis Davis (1846-1912), American artist and author, was born in Mattapoisett, Mass. He was director of decorations and of functions at the Columbian Exposition of 1893, and studied mural painting under La Farge, being one of the latter's assistant's in decorating Trinity Church, Boston. Millet is best known as a mural painter. The mural decoration for the Custom House at Baltimore—*The Evolution of Navigation*—is generally considered the artist's masterpiece. Other notable works are: *Wandering Thoughts*; *At the Inn*; *The Cozy Corner*; *The Window Seat*; *Between Two Fires*.

Millet, Jean François (1814-75), French painter, was born at Gruchy, close by Gréville, near Cherbourg. In 1840 he first exhibited at the Salon—a portrait—and during that and the following year passed some time at Cherbourg, painting portraits and filling small commissions. From 1845 to 1848 he painted many pictures of the nude, but resolved to abandon this field of art on hearing himself characterized as 'one who paints nothing but nude women.' He seems to have found himself with *The Winnower*, exhibited in 1848, and, the following year, being driven out of Paris by the cholera, he went with his comrade, Jacque, to the now famed village of Barbizon. The famous *Sower* was completed in 1850, mainly, however, from recollections of Normandy. In 1855 his *Peasants Grafting* won Gautier's praise, and was

bought by an American for \$800. It was followed by *The Gleaners* in 1857, *The Angelus* (1859), *Waiting* and *The Sheep-shearers* (1861), *The Man with the Hoe* and *Women Carding* (1863), *Shepherdess and Flock* (1864). A number of Millet's works are in the Metropolitan Museum, New York City, the Boston Art Museum, and the Walters collection, Baltimore.

Millikan, Robert Andrews (1868-), American physicist, was born in Morrison, Ill. Dr. Millikan was the first scientist to isolate and measure the electron. His other important achievements include the direct photo-electric determination of the fundamental radiation constant known as Planck's h ; the study of Brownian movements in



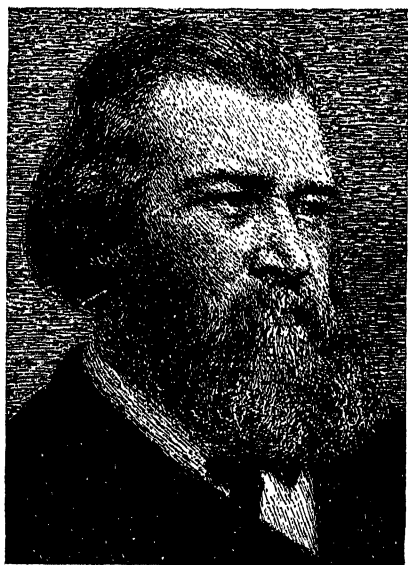
Robert A. Millikan.

gases; the extension of the ultra-violet spectrum; the law of motion of a particle falling toward the earth after it enters the earth's atmosphere; the determination of the nature of the so-called Millikan rays. He has been the recipient of the Comstock Prize of the National Academy of Sciences, of the Edison Medal of the American Institute of Electrical Engineers, the Nobel Prize (1923); gold medal from the Society of Arts and Sciences (1929); gold medal from the Roosevelt Memorial Association (1932). His most recent works include *Evolution of Science and Religion* (1927); *Science and The New Civilization* (1930); and *Time, Matter and Values* (1932); *Cosmic Rays* (1939).

Millikan Rays, high frequency rays of great penetrating power, originating in outer space, first noted in 1903 in experiments by British scientists who found an unexplained rate of leakage of an electric charge from an electroscope within an airtight metal chamber. This meant that the loss of charge was

due to some highly penetrating rays, like the gamma rays of radium, which could pass through metal walls as much as a centimetre thick and ionize the gas inside. This 'penetrating radiation' was at first attributed to radioactive metals in the earth or atmosphere, and this is, in fact, the source of the greater part of it.

In the summer of 1923, Professor Millikan and Dr. Russell Otis carried on further experiments, on the top of Pike's Peak, to determine, if possible, the nature of this radiation. They concluded, therefore, that if rays of cosmic origin existed at all, they must be of different characteristics from any as yet suggested. Further experiments were pursued in the summer of 1925, by Professor Millikan



Jean François Millet.

and Mr. Harvey Cameron, with two main objects in view: (1) To settle definitely the question of the existence or non-existence of a small very penetrating radiation of cosmic origin, a radiation so hard as to be uninfluenced by, and hence, unobservable with the aid of such screens as had been used in the Pike's Peak experiments, and (2) to throw light on the cause of the variation with altitude of the radiation of gamma-ray hardness which the Pike's Peak experiments showed to be more than twice as copious there as at Pasadena.

Sinking their electrosopes to depths down to 67 ft., the investigators brought to light

a radiation of extraordinary penetrating power. Here were rays at least one hundred times more penetrating than those previously known. To obtain definite evidence as to whether these very hard rays were of cosmic origin, coming in wholly from above and using the atmosphere merely as an absorbing blanket, the investigators carried on prolonged observations which showed that the rays in question do come in definitely from above, and that their origin is entirely outside the layer of atmosphere between the levels of the two lakes. Analysis of absorption curves shows that these rays are not homogeneous but are hardened as they pass through the atmosphere, just as x-rays are hardened by being filtered through a lead screen. The hardest rays observed by Millikan have an absorption coefficient of 0.18 per metre of water, and the softest which get down to Muir Lake a coefficient of 0.3 per metre. They would seem to come into the earth with equal intensity at all hours of day and night, and with practically the same intensity in all directions.

Reducing the absorption coefficients to wave lengths, a spectrum is found, about an octave in width, in a frequency region about 2,000 times higher than that of the mean x-ray, or as far above x-rays as x-rays are above light. The shortest wave length computed corresponds to a frequency 10,000,000 times higher than the frequency of visible light. When these extraordinarily high frequency rays strike the earth, they are transformed, in accordance with what is known as the 'Compton effect,' into soft rays such as were observed on Pike's Peak. The reason for the greater abundance of these soft rays on the mountain peaks than at the lower level of Pasadena is found simply in the fact that there are at such heights about three times as many of the hard rays to be transformed as at the lower altitude. An account of Professor Millikan's experiments were presented before the National Academy of Sciences on November 9, 1925, and published in the *Proceedings* of the Academy for January, 1926. Later studies of these so-called 'cosmic rays' have been made, the most recent in the ascents into the stratosphere by various observers, who carry instruments for their identification and determination.

Millinery is the art of making and trimming headgear for women and children, apparently an artificial product of civilization, being the result of fashion. It is one of the greatest industries in the United States.

Mills, Clarke (1815-83), American sculptor, was born in Onondaga co., N. Y. One of the first American sculptors to model equestrian statues, he equipped his own foundry near Washington, D. C., and in 1852 cast there the statue of General Jackson for Lafayette Park, Washington, and later (1860) a colossal equestrian statue of Washington, for which the government paid him \$50,000, then considered an extraordinary sum to be paid for a work of art. In 1863 he cast the statue of Liberty by Crawford which crowns the dome of the National Capital.

Mills, Darius Ogden (1825-1910), American capitalist, was born in North Salem, N. Y. He established the first bank in California, and invested in mines, timber, and railways. He was president of the Bank of California, San Francisco, at different periods. In 1880 he removed to New York. In New York he was a trustee of the Metropolitan Museum and president of the Botanical Garden, director in many banks, railroads, steamship and industrial companies, and was widely known as the builder and owner of the philanthropic Mills hotels.

Mills, Ogden L. (1884-1937), lawyer, was born in Newport, R. I. He was admitted to the New York bar in 1908 and practiced in New York City. From 1921-7 he was a member of Congress. In 1927 he became under-secretary of the Treasury. He held that position until 1932 when he became secretary of the Treasury and acted until March 4, 1933.

Mills, Robert (1781-1855), American engineer and architect, was born in Charleston, S. C., and became a pupil of Benjamin H. Latrobe. In 1837 was appointed by President Jackson architect of the government, in which position he had charge of the designing and constructing of the treasury, post office and patent office buildings in Washington, and of the Washington Monument, the cornerstone of which was laid in 1848.

Millstones, heavy stone discs used in grinding grain. American millstones are made of sandstones and conglomerates from the Appalachian region. Though largely replaced by steel rollers, particularly in the making of flour, stones are used for grinding coarser cereals, mineral paint, fertilizers, cement rock, and as pulpstones.

Millville, city, Cumberland co., New Jersey, on the Maurice River at the head of navigation. It is a noted glass-manufacturing center and has bleacheries, cotton mills, and

manufacturers of hosiery and house dresses. In the surrounding district vegetables and fruit are cultivated, especially peaches and small fruits, and poultry is raised; p. 14,806.

Milman, Henry Hart (1791-1868), English ecclesiastical historian and poet, was born in London. In 1840 Milman issued his collected *Poems*, and his *History of Christianity under the Empire*, which was coldly received. His highest achievement, however, is the *History of Latin Christianity down to the Death of Pope Nicholas V.* (1855).

Milmore, Martin (1844-83), American sculptor, born at Sligo, Ireland, and brought to the United States when a boy. In 1877 he modelled the Soldiers' and Sailors' Monument for Boston Common, which is considered his masterpiece. Among his other works are busts of Pope Pius ix., Wendell Phillips, Emerson, Charles Sumner (in the Metropolitan Museum, New York), Grant, Lincoln, and Webster.

Milne, Alan Alexander (1882-), English writer, began his journalistic career in London in 1903, soon became assistant editor of *Punch* and in the 1920's gave the world *When We Were Very Young*, which proved popular in America. Meanwhile there came from his pen a series of plays, some of which were successes in London and New York, including *The Dover Road* (1922); *Other People's Lives* (1932).

Milner, Alfred, First Viscount (1854-1925), English administrator, was born at Bonn in Germany. In 1897 he was sent out to be high commissioner for S. Africa and governor of Cape Colony. In this capacity he conducted with President Kruger the delicate negotiations that immediately preceded the outbreak of the Boer war of 1899-1902.

Milo (anc. *Melos*), isl. of the Cyclades, belonging to Greece, in the Ægean Sea, some 70 m. n. of Crete. It is rich in sulphur, manganese, gypsum, and salt, and has lead, zinc, clay, and obsidian. Chief tn. Plaka, near the ancient city of Melos (where the Venus of Milo in the Louvre, Paris, was discovered in 1820). Here many prehistoric remains have recently been found; p. 4,959.

Milo, or **Milon**, of Croton, in ancient Italy, was famous for his bodily strength; he was six times victor in wrestling, both at the Olympian and Pythian games. He was a follower of Pythagoras.

Miltiades, the famous Athenian, son of Cimon, was born probably about 540 B.C. When the Persian expedition under Datis approached Attica in 490 B.C., Miltiades

urged the policy of marching out from Athens to attack the Persians at Marathon. But there is little doubt that later traditions gave Miltiades an undue share of the credit of the victory, to the injury of Callimachus.

Milton. Tn., Norfolk co., Mass., 6 m. s. of Boston, on the Neponset R. On Blue Hills is the site of an observatory and station of the United States Meteorological Bureau. There are granite quarries; p.18,708.

Milton, John (1608-74), England's greatest epic poet, was born in Bread Street, Cheapside, his father being a scrivener. He went to Christ's College, Cambridge, in 1625. He had written during the Cambridge period the *Ode on the Nativity*, the lines on *Shakespeare* (prefixed to the second folio), the sonnets *To the Nightingale* and *On Arriving at the Age of Twenty-three*. At Horton Milton wrote the hexameters *Ad Patrem*; the companion poems *L'Allegro* and *Il Penseroso*; *Arcades*, the fragment of a masque; and the verses *At a Solemn Music*; and the masque of *Comus*, 'presented at Ludlow Castle by the family of the Earl of Bridgewater,' and *Lycidas*, on the death of Edward King, drowned in the Irish Sea. Before the execution of Charles I. he had almost completed his *Tenure of Kings and Magistrates*, in which he maintained that it was lawful to put a 'wicked king' to death. Its publication, in February, 1649, marked Milton as the best apologist for the new régime, and he was made Latin secretary to the Council of State. In 1652 he removed to Petty France, Westminster, and from this year must be dated also his blindness. In the last year of Cromwell's life was begun *Paradise Lost*, originally projected in 1639 or 1640 as a drama. Of his prose works at this period perhaps the most important were his *History of Britain to the Conquest* (1649), and a tract *Of True Religion*, etc (1673). More memorable was the publication in one volume together (1671) of *Paradise Regained* and *Samson Agonistes*. His *De Doctrina Christiana*, published in 1825, makes it manifest that he was an independent and even eccentric thinker, attached to no church system, Puritan or other. The trend of literary as well as ethical and political opinion was against him; poetry was gradually shaping itself into the form which it assumed under Pope and his successors; and none of Milton's contemporaries could have imparted to blank verse the majestic harmony which made *Paradise Lost* an effective protest against the bondage of rhyme. By far the

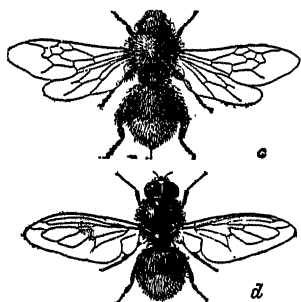
most comprehensive and exhaustive work on Milton is Professor Masson's *Life of Milton*, while his edition of the *Poems* is complete and masterly.

Milwaukee, city and port of entry, Wisconsin, largest city in the State and county seat of Milwaukee co., is situated on the w. shore of Lake Michigan; 85 m. n. of Chicago. The Milwaukee River and its tributaries, the Menominee on the w., and the Kinnickinnick on the s., admit the largest lake vessels to the warehouses along their banks. Among the principal buildings may be noted the Federal Building, containing the Post Office, Custom House, and U. S. Court House, the County Court House, and other civic buildings, the Chamber of Commerce, the City Hall, the Municipal Museum, the Layton Art Building, the Public Library, containing over 410,800 volumes, and the Auditorium, with a main hall seating 10,000 people. Educational institutions include six high schools, a State normal school, the Milwaukee Downer College for girls, Marquette University (R. C.). The city is the see of a Catholic archbishop and of an Episcopal bishop. Milwaukee is one of the greatest industrial and commercial cities of the north central part of the United States. The leading industries are machinery production; meat packing; manufacturing of boots and shoes, automobile accessories, electric and telephone supplies, flour and cereals, knit goods, soap and agricultural implements. Since the Repeal of Prohibition Milwaukee has 'once more assumed its position as one of the foremost beer producing cities of the United States. Milwaukee is governed by a mayor and a common council, the council consisting of 25 aldermen, one elected from each ward to serve for a term of four years. There are various administrative boards with broad powers, generally independent of the council except for financial supervision. The Indian derivative of the name Milwaukee signifies 'good land,' and before the founding of the city wild rice marshes occupied the bottom lands. The city was chartered in 1846, and Solomon Juneau became its first mayor. At the same date the Germans first began to settle at Milwaukee in considerable numbers and the city rapidly assumed the characteristics which won it the name of the 'German Athens of America.' Milwaukee has been a stronghold of the Socialist Party in America; p. 587,472.

Mimeograph, a copying machine invented in 1878 by Thomas A. Edison, by which an

indefinite number of copies of a manuscript can be made. A stencil, prepared by writing with a sharp stylus on a sheet of tissue paper stretched over a finely corrugated steel plate, is tightly fastened into a frame, and placed again on the steel plate with a sheet of paper between. An ink roller passed over it sends ink through the perforations in the stencil to the paper beneath.

Mimicry, in biology, the resemblance in shape, coloration, or both, between two species not closely allied, with the object of protecting one or both. Fritz Müller elaborated the hypothesis as follows: A species is said to be mimetic if it be itself apparently edible and persecuted or liable to persecution by insect-eating animals and if it occupies the same geographical area as another unrelated and inedible species, and closely resembles in appearance this species, while dif-



Examples of Mimicry among Exotic Insects.

(c) *Bombusdechamellus*; and (d) *Volucella bombilans*, a stingless fly, protected by its resemblance to the former.

fering markedly from its own immediate allies. No authenticated cases of true mimicry exist among mammals, but a number of instances may be cited among birds and reptiles. Thus, the Madagascar thrush or babbler bears a marked resemblance to the shrike of the same island, and the defenceless orioles of the Malayan Islands are similar in appearance to the powerful friar birds of that locality: while the guady colors of the deadly coral snakes of tropical America are mimicked by several harmless varieties.

Mimir, in Norse mythology, a giant owning the fountain of wisdom beneath the ash Yggdrasil, from which he allowed Odin to drink on his pledging an eye.

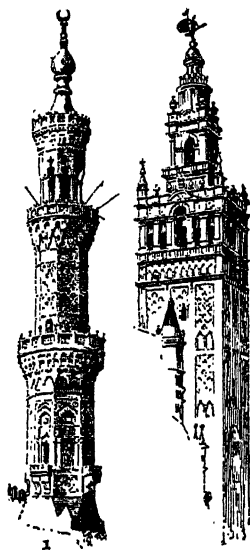
Mimnermus, Greek elegiac poet, born at

Smyrna, of the race of the Colophonians, who reconquered Smyrna from the Æolians. He lived at the end of the seventh and beginning of the sixth century B.C. He first gave to the elegiac measure its melancholy character, and was the first to use it for love poems.

Mimosaceæ, a sub-order of plants and trees belonging to the family Leguminosæ, and including about 1,400 species grouped in 30 genera, of which the most important are *Mimosa* and *Acacia*. Its members, which are mostly tropical or sub-tropical, are characterized by pinnate leaves; regular flowers with valvate corollas, arranged in heads or spikes; and leguminous fruits.

Mimulus, a genus of hardy and half-hardy herbaceous plants belonging to the order Scrophulariaceæ. They are of easy culture, and propagation is commonly effected by means of seeds.

Mimus, or **Mime** (from *mimicry*), a name given in ancient Greece and Italy to a certain form of the drama. It originally grew from extemporary imitations of ordinary life given at certain festivals. Greek mimes differed from Roman in being written in prose.

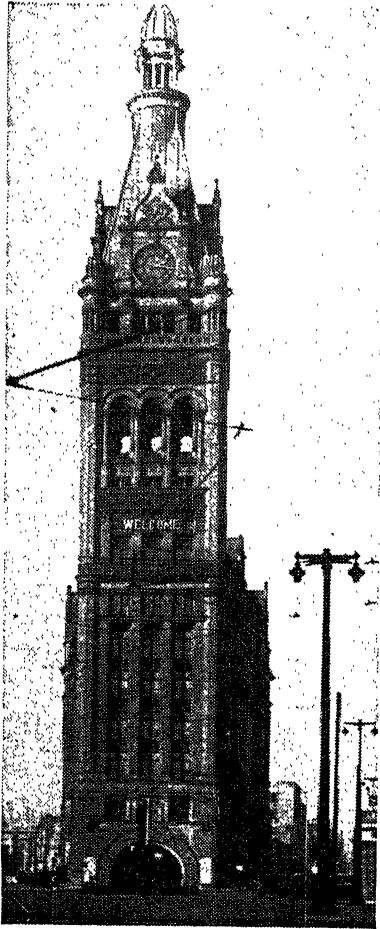


Minaret.

1, Mosque of Saida Zeynab, Cairo; 2, the Giralda Tower, Seville.

Minaret, a lofty tower of slender proportions decorating Mohammedan mosques, and

forming a distinctive feature of Saracenic architecture. It rises by a series of receding stories, with an outlook balcony at each landing, and terminates in a spire or pinnacle. A winding stairway leads to the uppermost balcony, from which the muezzin summons the faithful to worship. The form of the



City Hall, Milwaukee.

minaret is said to have been derived from the Pharos, the ancient lighthouse of Alexandria. The square minaret was common in Northern Africa, and was carried by the Moors into Spain. The most famous specimen is the Giralda at Seville, of which the tower of Madison Square Garden, New York City, is a reproduction.

Minas Bay, the main part of the east inlet

of the Bay of Fundy, which lies between New Brunswick and Nova Scotia. It is about 55 m. long.

Minas Geraes, state of Brazil. It lies within the great central plateau of Brazil, which here attains an average height of 2,000 ft. In mineral wealth, Minas Geraes ranks first among the Brazilian states. Gold, silver, iron, manganese, diamonds, topaz, amethysts, and tourmalines occur in abundance. Agriculture and stock raising are the principal industries. It became an independent government under the Portuguese crown in 1720, and was the scene of numerous revolts until 1889, when it declared its adherence to the newly formed Brazilian republic. The capital is Minas or Belo Horizonte. Area, 221,951 sq. m.; p. 4,250,000.

Minch, arm of the Atlantic Ocean, separating the northwest of the Scottish mainland from the northern part of the Outer Hebrides. The currents in the Minch are very rapid.

Mincio, river of Northern Italy, rises in Lake Garda, and after a southeast course of 120 m. joins the Po 10 m. s.e. of Mantua.

Mindanao, the second largest island of the Philippine archipelago, and the southernmost of the major group. Its area is 36,292 sq. m. exclusive of its dependent islands, which number 264 and cover 1,165 sq. m. The coast line is extremely irregular. The surface of Mindanao is extremely mountainous, with a number of irregular ranges, much modified by volcanic action, extending in a general n. and s. direction. There are many active and extinct volcanoes, and the highest peaks of the Philippines are located here. There are numerous lakes, of which the most famous is Lanao. The climate is hot and humid, particularly when the warm south and southeast winds prevail, though it is somewhat modified by cool inland breezes. The annual rainfall is more than 100 inches, often causing severe floods. The soil is very fertile, but until recently agriculture has received little attention. The chief products are rice, coffee, hemp, sugar cane, tobacco, corn, betel nuts, coconuts, and indigo. The raising of horses and cattle is an important industry; occupied by Japan, 1941; p. 560,000.

Mindoro, seventh in size of the Philippine Islands, lies south of the main portion of Luzon, from which it is separated by Verde Island Passage, $7\frac{1}{2}$ m. at its narrowest point. Its area is 3,851 sq. m., exclusive of 26 dependent islands, which bring the total to 4,024 sq. m. Coal and sulphur are found

in commercial quantities, and some gold has been located. The soil is very fertile, and large quantities of rice were formerly raised, giving the island the title granary of the Philippines; p. 33,000.

Mine Disasters. Mine accidents are of three general types: 1) ordinary accidents that occur in most large industries; 2) explosions of gas or coal dust; 3) cave-ins. The cave-in frequently results from an explosion.

Accidents of the first type have been decreasing in the last decade, due in part to smaller production and in part to the use of more safety devices.

The large accident rate of the second type

Mineralogy, the science which treats of Minerals, is an important division of Geology. A mineral is a homogenous substance, formed in the earth without the aid of life, of definite chemical composition and possessing characteristic physical properties. The importance of minerals in Geology is due to the fact that the rocks of which the earth is composed consist of aggregates of minerals. Minerals are of importance in Agriculture because of their distribution in the soil, where they exert great influence on vegetation. From a commercial point of view, they may be of value because of the metal they contain, such as iron, or because of certain properties, such as beauty and



Crystallized Minerals.

Group of crystals of quartz silicon dioxide.

has been due to inability to isolate the initial explosion whereby a column of air is set moving which raises up additional clouds of dust and gas which are ignited. The more recent major disasters of this type include that at the Millfield mine in Ohio in 1930 when 79 were killed; that at the Boissevain mine in Virginia with a loss of 38, and that at the Moweaqua mine in Illinois with a loss of 54. The last two occurred in 1932.

Of the third type, the most recent was the comparatively minor one in 1936 at the Moose River Gold Mine in Nova Scotia when three men were trapped by a cave-in and were not rescued until after ten days of tunneling. One death resulted.

In 1935 George S. Rice, Chief Mining Engineer of the U. S. Bureau of Mines, set up an experimental coal mine to help discover methods of combating mine disasters.

durability, which are conspicuous features of prime importance in gems and ornamental stones. Scientific study of minerals dates from the end of the eighteenth century. The science of mineralogy has advanced rapidly, and has been divided into a number of branches including Crystallographic Mineralogy, Chemical Mineralogy and Systematic Mineralogy.

Minerals are sometimes called by names which have come down to us from antiquity, as quartz; but in the majority of cases they are given the standard termination, *ite*, from the Greek *ites*, meaning like, or pertaining to. An important property is *hardness*, or resistance to scratching; this is described by reference to a standard scale of minerals, arranged so that the softest is 1 and the hardest 10. Specific gravity, or heaviness with reference to water, is another characteristic property. Cleavage, the tendency shown

by minerals to break with smooth planes in definite directions and fracture, the breaking along irregular surfaces, are also important physical properties. The optical properties largely depend on the crystalline form, or on the internal structure which controls also the form; but the refractive indices, the strength of the double refraction, the optical sign (whether positive or negative), and the axial angles of biaxial crystals are hardly less distinctive than the geometrical constants, which determine the external form. So delicate are these optical tests that of late years it has been possible, by their means alone, to ascertain exactly what minerals are present in the most close-grained rocks, when very thin, transparent sections of them are magnified by the microscope. This is the basis of the important branch of science connecting mineralogy with geology, known as Petrology.

Over a thousand mineral species have been described. The commonest mineral of the earth is Quartz, which occurs in igneous rocks of many kinds, in the sand derived by the disintegration of these rocks, in sedimentary rocks made up of reconsolidated sands, and in veins or fissure fillings throughout practically every known geological formation. Calcite is a common mineral, being found in massive form (limestone) making up great masses of rocks, and like quartz often occurring as distinct crystals in veins. Mineral groups frequently met with are Feldspar, the group comprising acid silicates of aluminum with potassium, sodium, calcium; the Mica group, a series of complex silicates containing water, characterized by the property of splitting or cleaving into extremely thin sheets; and the Amphibole and Pyroxene groups, mostly dark colored silicates, all occurring in many igneous rocks. The above minerals, together with clays, hydrous aluminum silicates which result from the decomposition of other aluminum-bearing minerals, and Limonite, an iron hydroxide, the weathering product of iron-bearing minerals, make up the greater part of the soil which constitutes the earth's surface.

Mineral Oils, a group of oils comprising petroleum and the derivatives of the oil shales of Scotland and other countries. They are more or less complete mixtures of hydrocarbons, and are believed to be the result of slow decomposition of animal and vegetable matter.

Mineral Waters, a term applied to any natural water that is characterized by some

mineral ingredient, and usually considered to possess therapeutic value. The term is commonly restricted to waters used for drinking purposes, generally as a remedial agent. In the United States, the Hot Springs of Arkansas are believed to have been the lure that led Ponce de Leon to discover Florida; and De Soto is said by legend to have recovered from wounds while resting there. The chief sources of mineral waters are natural springs, the special quality of the water being due to the mineral salts that are derived from the soil through which the water passes, often a corrosive agent, when saturated with carbonic acid gas. There are probably at least 10,000 such springs in the United States. Alkaline waters are those which contain alkaline carbonates such as alkaline earths, alkaline metals, and carbonates of alkalies. Alkaline-saline waters are those containing a combination of alkaline carbonates with sulphates or chlorides in fairly equal amounts. Saline waters constitute a large and important class; they may contain great quantities of hydrogen sulphide or carbon dioxide, and show all gradations from the weaker alkaline salines to the strong brines. Acid waters include all waters containing free acids. In this class are generally included the iron or chalybeate waters, although some authorities consider these as forming a class by themselves. Most of the commercially important mineral springs of the United States are in the eastern and central parts, New York being the leading State in the production of mineral waters. Saratoga Springs in that State enjoys a world-wide reputation, and its waters are extensively used throughout the country. Chief among foreign mineral waters are Apollinaris of Germany; Vichy of France; Hunyadi-Janos of Hungary; and Cherry Rock, Bath, and Burton Spa waters of England. The use of mineral waters under the direction of competent physicians at mineral spring health resorts and sanatoriums is generally attended by beneficial results. One of the chief sources of benefit is undoubtedly the accompanying change of habits, freedom from domestic and business care, relaxation, fresh air, and exercise.

Mineral Wool, known also as **Slag Wool**, **Rock Wool**, and **Cotton Fibre**, is a substance that resembles wool in appearance, but is composed of a mass of fine threads produced by subjecting molten slag or rock to a jet of steam or air.

Minerva, an ancient Roman goddess, identified with the Greek Athena. She was the

goddess of wisdom, and of arts and trades; and from another point of view, of war in its scientific aspect.

Mines, U. S. Bureau of, a division of the Department of Commerce, whose function is to conduct, in behalf of the public welfare, such fundamental inquiries as will lead to increased safety, efficiency, and economy in the mining industry of the United States. It maintains experimental stations solving the problems of treatment and utilization of minerals. The Health and Safety branch operates cars with crews instructing miners in first aid methods. It has also published valuable information circulars on methods and costs of mining, and has a library of motion picture films.

Minette, a rock belonging to the syenite group, in which biotite is a leading constituent, and which occurs in dykes.

Mine Workers of America, United. See **United Mine Workers of America.**

Minghetti, Marco (1818-86), Italian statesman. On Cavour's death, in 1861, he was regarded as his ablest representative in the Italian chamber. In 1863 he became Prime Minister. From 1873 to 1876 he was again Prime Minister.

Mingrelia (ancient *Colchis*), a region now included in the republic of Georgia. It passed under Russian control in 1803, but was not Russified until 1867.

Minho, or **Miño**, chief river of Galicia, Spain, flows s. through Lugo and s.w. through Orense, into the Atlantic, forming at its wide estuary part of the boundary between Spain and Portugal.

Miniature, properly, 'red leading,' or 'rubrication' as in the decoration of old mss. by picking out letters, drawing borders, arabesques, Scripture scenes, etc.; then, by incorrect etymology, a 'minute' portrait like those in such ornaments. Inlays of glass and precious stones were afterward replaced by enamel dating back to the Fourth Dynasty in Egypt. On these, and in the spaces of cloisonné, were drawn patterns or portraits. This art was mainly used for decorating snuff boxes and other articles now obsolete. A second source was the mediæval decoration of missals—'Hours,' Lives of the Saints, and the like. These were on vellum. But vellum cockles too badly to use in small pieces; and our early painters of independent miniature portraits generally used the backs of playing cards, which did not crack or curl. Their successors were thin sheets of ivory. It is curious that, while in theory and by

supposed meaning a miniature is any small portrait, in present usage the term is restricted to water color or *gouache*, oils being simply 'small portraits.' Toward the end of the seventeenth century ivory was introduced for water color. The invention of photography virtually killed miniature art.

Minims, Minimites, Fratres Minimi ('Lease Brethren') a religious order of the Roman Catholic Church, founded by St. Francesco di Paula about the middle of the fifteenth century.

Minimum Wage, a term used to signify the lowest wage adequate to maintain a reasonable standard of living. The statutory regulation of wages in the interest of the workers in private employment is a matter of comparatively recent development in the field of social legislation, and has occasioned much discussion. New Zealand (in 1894), seems to have been the pioneer in adopting minimum wage legislation.

In 1912 a permanent Minimum Wage Commission was established in Massachusetts, the first in the U. S. An impetus to the reform was given in the minimum wage provisions written into industrial codes prepared under the National Recovery Administration. New laws have been passed by the Legislatures of various states. Constitutional objections to such legislation have been raised when the law attempts to define too closely the 'living wage.' The so called Fair Labor Standards Act, a Federal law enacted 1938, fixes a minimum wage of 25 cents per hour and a maximum week of 44 hours, to develop progressively to 30 cents and 40 hours respectively. It provides for an administrator empowered to appoint committees to advance wages. It also restricts shipment in interstate commerce of goods manufactured in non-compliance with the administrator's mandates. See also **UNITED STATES, NEW DEAL.**

Mining. Strictly speaking the term mining includes those processes whereby the useful minerals are obtained from their natural localities, at or beneath the surface of the earth; in practice the term also often includes those methods of ore dressing to which most of the ores must be subjected to prepare them for the metallurgist. The prospector in the earlier days was usually a man of practical experience in mining camps, and therefore able to detect certain favorable features and recognize certain ores; nowadays the prospecting may be done by a highly trained corps of engineers and geologists. After the new ores have been tested by an

assayer, and the claim located, the prospect enters upon its second stage. Test pits, a development shaft, or a drift are run along the vein of ore, to give some idea of its extent and value. If it still looks promising the claim will next attract the attention of a mining geologist or a mining engineer, and an elaborate series of observations and tests will then be carried out. The general plan or method to be used in actual mining depends upon the location, extent, and richness of the deposit, the character and value of the mineral, and the nature and attitude of the enclosing rock. Thus, the mine may require either *surface development* or *underground* development. To the former belong quarries, pits, open cuts, and placers; to the latter, all of the various combinations of underground passages and chambers that have any connection with the production of ore. A special type of underground development is required for those materials mined in the liquid state, such as petroleum, sulphur and water; this is known as boring.

Mineral deposits may be divided into two broad classes. The first includes the beds or seams such as are found in iron ore, coal, and salt. The second class includes mineral veins or lodes (see *LODES*). In the first, it is desirable to make a hole of the shortest possible depth from the surface of the ground to the bed of mineral. A shaft is therefore sunk through valueless beds until the mineral is reached. Machinery of the best class is then used to extract the mineral. In the second class of deposits, the inclination of the mineral vein must be taken into account, as the deposit varies considerably in inclination and in size. Most deposits require a shaft. At first, the approved practice is to sink it on the vein, following whatever dip it may have—the object being to develop as much of the vein with as little dead work as possible. Drifts are run laterally on the vein, and some mines never require any different method. If the mine warrants a more elaborate system of greater capacity, a permanent shaft is sunk. This is preferably vertical, and located in the foot wall. From it, at convenient intervals or levels, cross cuts are driven to the vein, where, turning right and left, drifts follow the vein into the ore, where its removal leaves chambers or stopes. The various levels are then connected by winzes, or raises for convenience in handling the ore and for ventilation.

The U. S. Bureau of Mines has a number of instructive new motion picture films

which show where essential minerals are found and how they are extracted from the earth, refined, and manufactured.

The world output of gold has risen notably within the past ten years. Increasing prosperity is reported by the producers both of diamonds and of base metals; particularly of tin.

As most metal mines are in mountain country, the airplane is now used for transportation of ores, supplies, etc., also for prospecting, mapping, and geologic studies. Twelve thousand square miles of Michigan have been photographed from the air for the study of copper, iron and non-metallic deposits. And, in South America, 735 tons of mining machinery were flown from Cuzco to Huanocopampa over fifty miles of jungles and deep ravines. Each flight required only 30 minutes, and five trips were made in a day; the contrast with the former mul-service, taking three to five weeks for a round trip, is obvious. The airplane aids to eliminate mine isolation, and to provide better supervision, and longer working seasons.

The occurrence of mining disasters led to the establishment by the United States Bureau of Mines of an experimental coal mine. Here the conditions under which miners labor are artificially created; explosions are made and analyzed through the use of ingenious instruments of high sensitivity. Some 50 different kinds of dust including dust from Canada and England are carefully tested. Safety devices and methods are also tried out here, and training is given in rescue work.

The presence of silicosis among miners and quarry workers caused such concern that the Secretary of Labor appointed a special commission to work toward its control and elimination. The technique of prevention lies in the specialized control and collection of dust at the point of origin, so that it does not escape into the workroom. This precaution is sometimes abetted by wetting-down processes, and occasionally positive-pressure masks are worn, though these are practical only for short working periods.

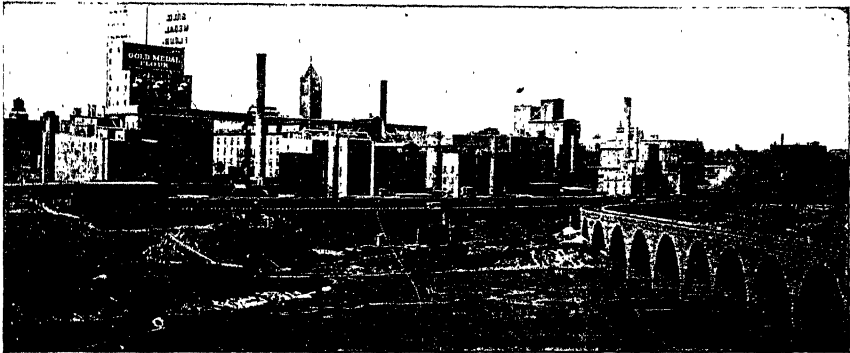
The American Institute of Mining and Metallurgical Engineers was incorporated under the laws of New York State in 1905 'to promote the . . . economic production of the useful minerals and metals and the welfare of those employed in these industries.' The Institute's *Transactions* contain the best papers of the year on mining. It also publishes *Mining and Metallurgy*, a monthly

magazine. Consult also the publications of the U. S. Geological Survey, especially *Mineral Resources of the United States* and of the Bureau of Mines; H. C. Hoover's *Principles of Mining*, *Mining Year Book*, 1935, 1936; *Engineering and Mining Journal*, Jan. 1937.

Mining Law, the body of rules regulating mineral rights. All laws relating to the ownership and operation of mining properties are regulated by statutes passed by Congress in any of its duly authorized sessions. Regarding the status of mining claims, American courts have usually held them to be real

the following ranks: ambassadors and papal legates, envoys and ministers accredited to sovereigns, ministers resident, and *chargés d'affaires* accredited to ministers for foreign affairs. A government may send to a foreign court a minister of any rank it pleases, but as a rule accredits one of the same rank as the representative accredited by that country. Christian preachers and priests are also called ministers.

Minium, or Red Lead (Pb_3O_4), a scarlet crystalline substance produced by the oxidation of massicot. It is chiefly used as a pigment.



Minneapolis: The World's Greatest Flour Mills.

estate, subject to the peculiar incidents regarding the conveying of lands of this character. It is a frequent practice to convey mining or mineral rights without including the fee to the land. The vendee or lessee only secures property rights in the minerals specified in the instrument, the right to go upon the land and open mines at proper places, and a right of way to transport the ore across the land to a convenient highway. Water rights and the privilege of cutting timber which may be necessary in working the mine are sometimes included.

Minister, one who has the chief direction of any department in a state. As a rule, ministers are placed in charge of the departments of foreign affairs, war, navy, finance, commerce, agriculture, justice, education, etc., but they may be *ministers without portfolios*. They are appointed directly by the chief executive or as in England, by the prime minister, who is chosen by the sovereign. In most countries the ministry is identical with the cabinet. In the *diplomatic service*, ministers are delegates or representatives of a government at a foreign court, and include

Mink, the name of several carnivores of the family of Mustelidæ, in the same genus as weasel, polecat, ferret, and ermine, and with essentially similar characteristics. The fur is dense and close, and is usually of a dark



Mink.

brown color. The mink is an aquatic animal. It is readily tamed when taken young, and is occasionally bred in captivity in America in some numbers for the sake of its valuable fur. In Eastern Asia occurs the Siberian mink (*M. Siberica*), which is more nearly related to the polecat.

Minneapolis, city of Minnesota, county

seat of Hennepin co., is located on both banks of the Mississippi River, immediately above the twin city of St. Paul. It has an altitude of 700-800 feet above sea level, which, with its invigorating climate, pure water supply, and natural drainage, makes it one of the healthiest cities in the world. Minneapolis possesses a park system of unusual scope and beauty. Seven miles distant is Lake Minnetonka, about 15 m. long, with numerous islands—a favorite resort for boating, bathing, and fishing. Minneapolis is the seat of the University of Minnesota. The rapid development of Minneapolis is due to its natural advantages, and the position of the city as the natural market and gateway for an extensive agricultural and forest region. The leading industry is flour milling. Minneapolis is known as the 'Flour City.' Its other extensive industries include motor vehicles, linseed products, railroad car construction, bakery products, printing and publishing; p. 492,370. The Falls of St. Anthony, the nucleus of the present city of Minneapolis, were discovered and named by Louis Hennepin, a French monk, in 1680, but the region was not again visited until the coming of Jonathan Carver in 1776. The territory was obtained by the United States in 1807, when Zebulon Pike signed a treaty with the Sioux whereby the Indians relinquished their title. In 1836 Major Plympton staked a claim on the east side of the falls; other soldiers settled there, and soon the village of St. Anthony was formed. Since 1872, when St. Anthony and Minneapolis were consolidated as the City of Minneapolis, the growth of the city has been extremely rapid.

Minnehaha, Falls of, a waterfall, about 50 ft. in height, in the Minnehaha River, Minn., a tributary of the Mississippi.

Minnesingers, German and Austrian lyric poets of the twelfth, thirteenth and fourteenth centuries. These minstrel poets led a wandering life, going from one court or nobleman's mansion to the other.

Minnesota (a Sioux word meaning 'cloudy water' or sky-tinted water; popularly known as the 'Gopher State'), one of the North Central States of the United States. It contains sources of many rivers, as the Mississippi and St. Lawrence, and touches Lake Superior. It also has many lakes. The average elevation of the State is about 1,200 ft. above sea level. The lowest points are along the Mississippi River in the southeast and Duluth on Lake Superior. Running north from Douglas co., and northeast through

Itasca co. is a highland; the highest points of this divide are the Mesabi Range (2,400 ft.) and the Misquah Hills (2,200 ft.), which are the only true mountain elevations in Minnesota. The southwesterly half of the State is in large part gently rolling prairie. The winters are rigorous, but tempered by the dryness and bracing qualities of the air, and the summers are mild. The soil is almost entirely a glacial drift, consisting of boulder clay and heavy black loam of great richness. It is largely an agricultural state with flour mills, and butter, cheese, lumber, and wheat and corn raising is important. It also ranks high in the mining of iron ore. The ore is to a great extent shipped from the State, the principal ports being Duluth and Two Harbors. Also of importance is the quarrying of stone.

Minnesota was originally heavily timbered in the northern part, but its forests of white pine have been frequently ravaged by fire and lumbering. According to the Federal Census for 1940, the population of Minnesota was 2,792,300. The State University, the University of Minnesota, situated at Minneapolis, is one of the foremost institutions of higher learning in the country. The present constitution of Minnesota was adopted in 1857. The chief executive officers are a Governor, Lieutenant-Governor, Secretary of State, Treasurer, and Attorney-General, elected biennially, and an Auditor elected for four years. Under the Reapportionment Act Minnesota has nine Representatives in the National Congress. St. Paul is the State capital.

History.—The first white men to visit Minnesota were French fur traders, who came by way of the Great Lakes about 1658. In 1673 two Jesuit priests visited the Saulte Ste. Marie, and sent back to France a description of the great copper deposits. In the summer of 1679 Sieur du Luth, a Frenchman, penetrated from Lake Superior into Northern Minnesota as far as the great village of the Sioux on Mille Lacs. The territory was first claimed by the French because of their explorations, but the part east of the Mississippi was ceded to the English at the close of the French and Indian War (1763), and in 1783 England transferred her title to the United States. About 1840 lumbering on a commercial scale began, and great rafts of logs were floated down the Mississippi and St. Croix Rivers as far as St. Louis. For a long period lumbering and the fur trade were the only industries, the prairie lands of the

southern portion being held by the Indians. Treaties with the Sioux and Chippewa Indians, negotiated in 1837 and ratified by the Senate in 1838, opened for settlement the territory between the St. Croix and Mississippi Rivers and extending northward to Mille Lacs. Stillwater was founded in 1843, and St. Anthony (now a part of Minneapolis) in 1847. In 1851 treaties were negotiated with the Sioux by which they ceded the territory west of the Mississippi River and South of the Otter Tail country. The Indians were then established on a reservation extending along the Minnesota River from Lake Traverse to the Little Rock River; this territory they retained until after the Sioux outbreak of 1862.

The region east of the Mississippi, which was included in the Northwest Territory constituted by Congress in 1787, was successively a part of the Territories of Indiana, Illinois, Michigan, and Wisconsin; while that west of the Mississippi was a part of the Territories of Louisiana, Missouri, Michigan, Wisconsin, and Iowa. In 1849 the Territory of Minnesota was organized, with a population of 4,545, and an area much larger than that of the present State, and on May 11, 1858, Minnesota was admitted as a State into the Union. The most interesting political development of the State within recent years is the Farmer-Labor Party which succeeded in electing Senators to the U. S. Congress in 1922, 1923 (special election), 1928 and 1930. Roosevelt carried the State in 1932, 1936, 1940. Republicans in 1940 elected the governor, U. S. senator, and 7 congressmen.

Minnesota River, rises in Big Stone Lake, on the boundary between Minnesota and South Dakota, and flows s.e., and finally n.e., to its junction with the Mississippi between Minneapolis and St. Paul.

Minnesota, University of, a coeducational State institution at Minneapolis, organized in 1851, and reorganized in 1860-4 and 1868. The 1933 registration was 11,292. The University in 1933 received funds from the Carnegie Corporation and Rockefeller foundation for an economic and social study of unemployment and an Institute of Child Welfare.

Minnetaris, Minnetarees, sometimes known as the Hidatsa, a Siouan tribe with a culture similar to that of the Mandans, living near the junction of the Knife and Missouri Rivers.

Minnow, in the United States, any of various small fishes of brooks and ponds, es-

pecially the shiners. In Europe the name originally and specifically belong to a cyprinodont (*Leuciscus phoxinus*.)

Minoan Civilization, the name applied to an ancient Cretan civilization antedating historical records.

Minor, in law, is a person who has not attained his legal majority. Also a term used in music, a semitone less than the major.

Minor, Robert Crannell (1840-1904), American landscape painter, was born in New York City. The New York Metropolitan Museum of Art contains his *Twilight*.

Minorca (Spanish *Menorca*), the second largest of the Balearic Isles, in the Mediterranean, 25 m. n.e. of Majorca. Port Mahon is the capital; p. 42,000.

Minos, in ancient Greek legend, two kings of Crete. The first was the son of Zeus and Europa, brother of Rhadamanthus, king and legislator of Crete, and after his death one of the judges of the dead in the lower world. The second was the grandson of the above; his wife was Pasiphaë, and among his children were Deucalion, Androgeos, and Ariadne. He ruled at Minos, the extent and intricacy of whose palace probably gave rise to the story of the famous Labyrinth.

Minotaur, in ancient Greek legend, a monster with a man's body and a bull's head, the off-spring of Pasiphaë, Minos's wife and a bull. Minos confined him in the Labyrinth and exposed to him the Athenian youths and maidens who were sent to him as tribute by the Athenians, until Theseus, who voluntarily was included in their number, killed the monster, and by the aid of Ariadne, who gave him a clue of thread, escaped from the Labyrinth.

Minsk, capital of White Russia in the U. S. S. R., is the junction point of the Moscow-Warsaw railroad; p. 123,613. It was formerly the seat of the Orthodox and Roman Catholic bishops and has two cathedrals. It has trade in grain and lumber, and many manufactures. The province Minsk, in which it is situated, is rich in agricultural resources and at Minsk in 1927 was established an institute of agriculture and forestry.

Minster (Latin *monasterium*, 'a monastery'), the church of an abbey or priory; but often applied, like the German *Münster*, to cathedral churches without any monastic connection, as especially to York Minster.

Minstrels, the English term for wandering singers of the Middle Ages, corresponding in general to the French *troubadours* and the German *minnesingers*. The term in early



Photo by Eugene J. Hall, Oak Park, Ill. Courtesy of Chicago & North Western Railway. Minnehaha Falls, Minnesota.

usage was very broad, including almost every one who made a profession of entertaining, whether by reciting and singing songs of love and war, or by ordinary buffoonery and jugglery. The social status of the minstrels declined as they became associated with wandering mountebanks. The final break-up of the minstrelsy was due largely to the invention of printing, as a result of which books became the distributing agents of literature.

NEGRO MINSTRELS.—The so-called negro minstrels of the United States are bands of white men blacked and dressed as negroes, who offer a programme consisting of ballads, jokes, and variety acts.

Mint (*Mentha*) a genus of plants, of the natural order Labiatæ. The species are widely distributed over the world, and contain an aromatic essential oil, in virtue of which they are more or less medicinal. The most important species are Spearmint, Peppermint, and Pennyroyal. All these species, in a wild state grow in ditches or wet places, and are naturalized in America. They are easily grown in gardens, preferring a rather moist location. In order to obtain a supply of fresh mint through the winter months, roots may be placed in a box of soil, kept in a temperature of about 60° F., and well supplied with water.

